H1584

0056887

Eberline Services W.O. No. R1-11-055-7143 Bechtel Hanford Inc. SDG H1584

Case Narrative

Page 1 of 2

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1584 was composed of one solid (soil) sample designated under SAF No. B02-006 with a Project Designation of: 100 Area Source Characterization 200-CS-1 OU – Soil Sampling.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on January 14, 2002.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

EDMC

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.3 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.4 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.5 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.7 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.8 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative

Page 2 of 2

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa C. Mannion

Program Manager

Date

SAMPLE DELIVERY GROUP H1584

SDG 7143 Contact Melissa C. Mannion

SAMPLE SUMMARY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Case no <u>SDG H1584</u>

CLIENT SAMPLE ID	LOCATION	MATRIX LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B13D73	200 East	SOLID	R111055-01	B02-006	B02-006-08	11/02/01 07:30
Method Blank		SOLID	R111055-03	B02-006		
Lab Control Sample		SOLID	R111055-02	B02-006		
Duplicate (R111055-01)	200 East	SOLID	R111055-04	B02-006		11/02/01 07:30

SAMPLE SUMMARY
Page 1
SUMMARY DATA SECTION
Page 3

SDG	7143		
Contact	Melissa	С.	<u>Mannion</u>

QC SUMMARY

Client	<u>Hanford</u>
Contract	No. 630
Case no	SDG H1584

QC BATCH	CHAIN OF	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS S	_	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7143	802-006-08	B13D73	SOLID	94.0	1218 g		11/07/01	5	R111055-01	7143-001
		Method Blank	SOLID		<u> </u>				R111055-03	7143-003
		Lab Control Sample	SOLID						R111055-02	7143-002
		Duplicate (R111055-01)	SOLID	94.0	1218 g		11/07/01	5	R111055-04	7143-004

QC SUMMARY
Page 1
SUMMARY DATA SECTION
Page 4

SDG 7143 Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Case no <u>SDG H1584</u>

			PREPARATION	ERROR	PLANCHETS ANALYZED						QUALI-
TEST	MATRIX	METHOD	BATCH	2σ %	CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG MS/ORIG	FIERS
Alpha AM	Spectros SOLID	copy Americium 241 in Soil	7012-169	5.0	1			1	1	1/1	
MP	SOLID	Neptunium in Soil	7012-169	5.0	1	<u></u>	•	1	1	1/1	<u> </u>
PU	SOLID	Plutonium, Isotopic in Solids	7012-169	5.0	1			1	1	1/1	
TH	SOLID	Thorium, Isotopic in Soil	7012-169	5.0	1			1	1	1/1	
Beta SR	Counting SOLID	Total Strontium in Soil	7012-169	10.0	1			1	1	1/1	
Gas P 93A	roportion SOLID	al Counting Gross Alpha in Soil	7012-169	20.0	1			1	1	1/1	
93B	SOLID	Gross Beta in Soil	7012-169	15.0	1			1	1	1/1	
Gamma GAM	Spectros SOLID	copy Gamma Scan	7012-169	15.0	1			1	1	1/1	
Kinet U_T	ic Phosph SOLID	orimetry Uranium, Total in Soil	7012-169	9.0	1			1	1	1/1	

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group. Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

PREP BATCH SUMMARY
Page 1
SUMMARY DATA SECTION
Page 5

SDG 7143 Contact Melissa C. Mannion

WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1584

CLIENT SAMPLE ID		MATRIX	LAB SAMPLE II COLLECTED)		SUF-				
CUSTODY	SAF No		RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
B13D73			R111055-01	7143-001	93A/93		01/04/02	01/14/02	MCM	Gross Alpha in Soil
200 East		SOLID	11/02/01	7143-001	938/93		01/04/02	01/14/02	MCM	Gross Beta in Soil
B02-006-08	B02-006		11/07/01	7143-001	AM		12/27/01	01/14/02	MCM	Americium 241 in Soil
				7143-001	GAM		12/18/01	01/14/02	MCM	Gamma Scan
				7143-001	NP		12/20/01	01/14/02	MCM	Neptunium in Soil
				7143-001	PU		12/21/01	01/14/02	MCM	Plutonium, Isotopic in Solids
				7143-001	SR		12/18/01	01/14/02	MCM	Total Strontium in Soil
				7143-001	TH		01/09/02	01/14/02	MCM	Thorium, Isotopic in Soil
				7143-001	U_T		12/19/01	01/14/02	MCM	Uranium, Total in Soil
Method Blank			R111055-03	7143-003	93A/93		01/02/02	01/14/02	MCM	Gross Alpha in Soil
		SOLID		7143-003	938/93		01/02/02	01/14/02	MCM	Gross Beta in Soil
	B02-006			7143-003	AM		12/27/01	01/14/02	MCM	Americium 241 in Soil
				7143-003	GAM		12/17/01	01/14/02	MCM	Gamma Scan
				7143-003	NP		12/20/01	01/14/02	MCM	Neptunium in Soil
				7143-003	PU		12/21/01	01/14/02	MCM	Plutonium, Isotopic in Solids
				7143-003	SR		12/18/01	01/14/02	MCM	Total Strontium in Soil
				7143-003	TH		01/08/02	01/14/02	MCM	Thorium, Isotopic in Soil
				7143-003	U_T		12/19/01	01/14/02	MCM	Uranium, Total in Soil
Lab Control Sa	mple		R111055-02	7143-002	93A/93		01/07/02	01/14/02	MCM	Gross Alpha in Soil
		SOLID		7143-002	93B/93		01/07/02	01/14/02	MCM	Gross Beta in Soil
	B02-006			7143-002	AM		12/28/01	01/14/02	MCM	Americium 241 in Soil
				7143-002	GAM		12/15/01	01/14/02	MCM	Gamma Scan
				7143-002	NP		12/20/01	01/14/02	MCM	Neptunium in Soil
				7143-002	PU		12/21/01	01/14/02	MCM	Plutonium, Isotopic in Solids
				7143-002	SR		12/18/01	01/14/02	MCM	Total Strontium in Soil
				7143-002	TH		01/08/02	01/14/02	MCM	Thorium, Isotopic in Soil
				7143-002	U_T		12/19/01	01/14/02	MCM	Uranium, Total in Soil
Duplicate (R11	1055-01)		R111055-04	7143-004	93A/93		01/08/02	01/14/02	MCM	Gross Alpha in Soil
200 East		SOLID	11/02/01	7143-004	938/93		01/08/02	01/14/02	MCM	Gross Beta in Soil
	B02-006		11/07/01	7143-004	MA		12/27/01	01/14/02	MCM	Americium 241 in Soil
				7143-004	GAM		12/18/01	01/14/02	MCM	Gamma Scan
				7143-004	NP		12/20/01	01/14/02	MCM	Neptunium in Soil
				7143-004	PU		12/21/01	01/14/02	MCM	Plutonium, Isotopic in Solids
				7143-004	SR		12/18/01	01/14/02	MCM	Total Strontium in Soil
				7143-004	TH		01/08/02	01/14/02	MCM	Thorium, Isotopic in Soil
				7143-004	U_T		12/19/01			Uranium, Total in Soil

NORK SUMMARY
Page 1
SUMMARY DATA SECTION
Page 6

SDG <u>7143</u> Contact <u>Melissa C. Mannion</u>

WORK SUMMARY, cont.

Client	Hanford	
Contract	No. 630	
Case no	SDG H1584	

TEST	SAF No	COUNTS OF	P TESTS BY SAN	CLIENT MORE	RE BLANK	LCS	DUP SPIKE	TOTA
93A/93	B02-006	Gross Alpha in Soil	900.0_ALPHABETA_GPC	1	1	1	1	4
93B/93	B02-006	Gross Beta in Soil	900.0_ALPHABETA_GPC	1	1	1	1	4
AM	B02-006	Americium 241 in Soil	AMCMISO_IE_PLATE_AEA	1	1	1	1	4
GAM	B02-006	Gamma Scan	GAMMA_GS	1	1	1	1	4
NP	B02-006	Neptunium in Soil	NP237_LLE_PLATE_AEA	1	1	1	1	4
PU	B02-006	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1	1	1	1	4
SR	B02~006	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1	1	1	1	4
TH	B02~006	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	1	1	1	1	4
U_T	B02-006	Uranium, Total in Soil	UTOT_KPA	1	1	1	1	4
TOTALS				9	9	9	9	36

WORK SUMMARY
Page 2
SUMMARY DATA SECTION
Page 7

R111055-03

METHOD BLANK

Method Blank

I .	7143 Melissa C. Mannion	Client/Case no Contract	 SDG_H1584
Lab sample id Dept sample id		Client sample id Material/Matrix SAF No	 SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI~ FIERS	TEST
Gross Alpha	12587-46-1	-0.330	1.3	2.7	10	U	93A
Gross Beta	12587-47-2	-0.406	3.3	5.6	15	υ	93B
Total Strontium	SR-RAD	-0.048	0.11	0.23	1.0	υ	SR
Thorium 228	14274-82~9	0.031	0.12	0.23		U	TH
Thorium 230	14269-63-7	-0.152	0.18	0.37	1.0	ប	TH
Thorium 232	TH-232	-0.030	0.061	0.23	1.0	υ	TH
Total Uranium (ug/g)	7440-61-1	0	0.001	0.002	0.10	ប	U_T
Neptunium 237	13994-20-2	0	0.058	0.086	1.0	U	NP
Plutonium 238	13981-16-3	0	0.026	0.098	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.013	0.026	0.098	1.0	บ	PU
Americium 241	14596-10-2	-0.026	0.11	0.25	1.0	υ	AM
Potassium 40	13966-00-2	U		0.32		U	GAM
Cobalt 60	10198-40-0	U		0.021	0.050	ช	GAM
Cesium 137	10045-97-3	U		0.018	0.10	ប	GAM
Radium 226	13982-63-3	U		0.031	0.10	U	GAM
Radium 228	15262-20-1	U		0.083	0.20	U	GAM
Europium 152	14683-23-9	Ŭ		0.046	0.10	ប	GAM
Europium 154	15585-10-1	υ		0.044	0.10	U	GAM
Europium 155	14391-16-3	υ		0.044	0.10	U	GAM
Thorium 228	14274-82-9	σ		0.028		U	GAM
Thorium 232	TH-232	υ		0.083		ប	GAM
Uranium 235	15117-96-1	U		0.066		Ü	GAM
Uranium 238	U-238	U		2.5		U	GAM
Americium 241	14596-10-2	υ		0.056		U	GAM

200 Area Source Chara. 200-CS-1 OU

QC-BLANK 40582

METHOD BLANKS
Page 1
SUMMARY DATA SECTION
Page 8

R111055-02

LAB CONTROL SAMPLE

Lab Control Sample

SDG <u>7143</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> SDG H1584 Case no <u>No. 630</u>
Lab sample id <u>R111055-02</u> Dept sample id <u>7143-002</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix <u>SOLID</u> SAF No <u>B02-006</u>

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCî/g	REC %	3σ LMTS (TOTAL)	PROTOCOI LIMITS
Gross Alpha	226	8.8	2.0	10		93A	200	8.0	113	65 - 135	70-130
Gross Beta	224	6.5	4.2	15		938	217	8.7	103	76-124	70-130
Total Strontium	22.8	0.85	0.24	1.0		SR	21.8	0.87	105	82-118	80-120
Thorium 230	41.5	1.6	0.31	1.0		TH	40.8	1.6	102	89-111	80-120
Total Uranium (ug/g)	16.7	2.1	0.020	0.10		U_T	16.5	0.66	101	76-124	80-120
Neptunium 237	19.0	1.5	0.19	1.0		NP	19.9	0.80	95	85-115	80-120
Plutonium 238	23.9	1.6	0.096	1.0		PU	24.6	0.98	97	86-114	80-120
Plutonium 239/240	26.0	1.7	0.096	1.0		PU	26.4	1.1	98	86-114	80-120
Americium 241	19.8	2.0	0.26	1.0		AM	19.1	0.76	104	81-119	80-120
Cobalt 60	1.17	0.075	0.034	0.050		GAM	1.04	0.042	112	72-128	80-120
Cesium 137	1.33	0.067	0.040	0.10		GAM	1.22	0.049	109	73-127	80-120

200 Area Source Chara. 200-CS-1 OU

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	UL LUS	40201					
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LAB CONTROL SAMPLES
Page 1
SUMMARY DATA SECTION
Page 9

Lab id <u>IMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-LCS</u>

Version <u>3.06</u>

Report date <u>01/14/02</u>

R111055-04

DI T.C.3 M.D.

DUPLICATE

SDG	7143		Client/Case no	Hanford	SDG H1584
Contact	Melissa C. Mannion			No. 630	
	DUPLICATE	ORIGINAL			
Lab sample id	R111055-04	Lab sample id <u>R111055-01</u>	Client sample id	813D73	
Dept sample id	<u>7143-004</u>	Dept sample id <u>7143-001</u>	Location/Matrix	200 East	SOLID
		Received <u>11/07/01</u>	Collected/Weight	11/02/01 07:30 121	18 g
% solids	94.0	% solids <u>94.0</u>	Custody/SAF No	В02-006-08 В02-	006_

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI~ FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- Flers	RPD %	3 <i>a</i> TOT	PRO
Gross Alpha	2.31	3.0	3.9	10	U	93A	2.42	2.7	3.2	U			
Gross Beta	58.2	6.1	5.9	15		93B	55.8	6.3	6.5		4	39	
Total Strontium	23.1	0.88	0.23	1.0		SR	24.6	0.63	0.17		6	22	
Thorium 228	0.673	0.28	0.21			TH	0.451	0.13	0.085		40	83	
Thorium 230	0.278	0.28	0.34	1.0	U	TH	0.806	0.21	0.28	J	97	98	
Thorium 232	0.362	0.22	0.21	1.0	j	TH	0.358	0.11	0.053	J	1	103	
Total Uranium (ug/g)	0.562	0.072	0.020	0.10		U_T	0.612	0.078	0.020		9	33	
Neptunium 237	-0.027	0.054	0.21	1.0	U	NP	0	0.061	0.092	U	-		
Plutonium 238	0.013	0.027	0.10	1.0	IJ	PU	0.006	0.012	0.023	IJ			
Plutonium 239/240	0.013	0.027	0.10	1.0	IJ	PU	-0.009	0.018	0.043	Ü	-		
Americium 241	0.029	0.059	0.22	1.0	υ	AM	0	0.12	0.23	υ	-		
Potassium 40	8.84	0.84	0.58			GAM	10.4	0.73	0.34		16	36	
Cobalt 60	U		0.041	0.050	U	GAM	U		0.036	U	-		
Cesium 137	U		0.038	0.10	U	GAM	U		0.034	u	-		
Radium 226	0.336	0.076	0.082	0.10		GAM	0.333	0.062	0.068		1	54	
Radium 228	0.521	0.18	0.20	0.20		GAM	0.660	0.14	0.13		24	66	
Europium 152	U		0.090	0.10	U	GAM	U		0.077	Ü	_		
Europium 154	U		0.14	0.10	U	GAM	U		0.12	U			
Europium 155	U		0.12	0.10	Ü	GAM	U		0.13	Ų	-		
Thorium 228	0.525	0.045	0.049			GAM	0.543	0.041	0.041		3	36	
Thorium 232	0.521	0.18	0.20			GAM	0.660	0.14	0.13		24	66	
Uranium 235	IJ		0.15		U	GAM	U		0.15	U	-		
Uranium 238	U		5.2		U	GAM	U		4.4	U	-		
Americium 241	U		0.15		U	GAM	U		0.27	Ú	_		

200 Area Source Chara. 200-CS-1 OU

QC-DUP#1 40583

DUPLICATES
Page 1
SUMMARY DATA SECTION
Page 10

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 01/14/02

B13D73

R111055-01

DATA SHEET

B13D73

•	7143 Melissa C. Mannion	Client/Case no Contract		H1584
		Client sample id Location/Matrix Collected/Weight Custody/SAF No	200 East 11/02/01 07:30 1218 g	SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pC1/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	2.42	2.7	3.2	10	ŭ	93A
Gross Beta	12587-47-2	55.8	6.3	6.5	15		93B
Total Strontium	SR-RAD	24.6	0.63	0.17	1.0		SR
Thorium 228	14274-82-9	0.451	0.13	0.085			\mathtt{TH}
Thorium 230	14269-63-7	0.806	0.21	0.28	1.0	J	TH
Thorium 232	TH-232	0.358	0.11	0.053	1.0	J	TH
Total Uranium (ug/g)	7440-61-1	0.612	0.078	0.020	0.10		UT
Neptunium 237	13994-20-2	0	0.061	0.092	1.0	ប	NP
Plutonium 238	13981-16-3	0.006	0.012	0.023	1.0	U	ΡŪ
Plutonium 239/240	PU-239/240	-0.009	0.018	0.043	1.0	U	PU
Americium 241	14596-10-2	0	0.12	0.23	1.0	U	AM
Potassium 40	13966-00-2	10.4	0.73	0.34			GAM
Cobalt 60	10198-40-0	ប		0.036	0.050	ਧ	GAM
Cesium 137	10045-97-3	U		0.034	0.10	U	GAM
Radium 226	13982-63-3	0.333	0.062	0.068	0.10		GAM
Radium 228	15262-20-1	0.660	0.14	0.13	0.20		GAM
Europium 152	14683-23-9	ע		0.077	0.10	ប	GAM
Europium 154	15585-10-1	Ŭ		0.12	0.10	ប	GAM
Europium 155	14391-16-3	U		0.13	0.10	ប	GAM
Thorium 228	14274-82-9	0.543	0.041	0.041			GAM
Thorium 232	TH-232	0.660	0.14	0.13			GAM
Uranium 235	15117-96-1	ប		0.15		U	GAM
Uranium 238	U-238	υ		4.4		ប	GAM
Americium 241	14596-10-2	U		0.27		U	GAM

200 Area Source Chara. 200-CS-1 OU

DATA SHEETS
Page 1
SUMMARY DATA SECTION
Page 11

SAMPLE DELIVERY GROUP H1584

Test	AM Matrix SOLID
SDG	7143
Contact	Melissa C. Mannion

METHOD SUMMARY AMERICIUM 241 IN SOIL ALPHA SPECTROSCOPY

Client	Hanf	ord	
Contract	No.	630	
Contract	SDG	H1584	

RESULTS

PLE ID TEST F	UF- IX PLANCHET		ricium 241
1055-01	7143-001	U	
1055-03	7143-003	υ	
1055-02	7143-002	ok	
1055-04	7143-004	-	U
	1055-01 1055-03 1055-02 1055-04	1055-01 7143-001 1055-03 7143-003 1055-02 7143-002	1055-01 7143-001 U 1055-03 7143-003 U 1055-02 7143-002 ok

METHOD PERFORMANCE

CLIENT SAMPLE ID	SAMPLE ID		SUF- FIX	MDA pCi/g		PREP	DILU-	X YIELD			FWHM keV	 	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7012-	169 2σ	prep er	ror 5	.0 %	Reference	Lab	Notebool	7012	pg.	169					
B13D73	R111055-0	1		0.23	0.500			80		104		55	12/27/01	12/27	SS-031
BLK (QC ID=40582)	R111055-0	3		0.25	0.500			84		105			12/27/01	12/27	SS-041
LCS (QC ID=40581)	R111055-0	2		0.26	0.500			81		105			12/27/01	12/28	SS-033
Duplicate (R111055-01) (QC 1D=40583)	R111055-0	4		0.22	0.500			80		105		55	12/27/01	12/27	SS-049
Nominal values and limi	ts from met	hod		1.0	0.500			20-10	5	100	100	 180			

PROCEDURES	REFERENCE	AMCMISO IE PLATE_AEA
, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-940	Plutonium Separation and Purification, rev 3
	CP-960	Americium-Curium Purification, Large Aliquot,
		rev 4
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD	MDA <u>0.24</u> ± <u>0.037</u>
FOR 4 SAMPLES	YIELD 81 ± 4

METHOD SUMMARIES
Page 1
SUMMARY DATA SECTION
Page 12

 Lab id
 TMANC

 Protocol
 Hanford

 Version
 Ver 1.0

 Form
 DVD-CMS

 Version
 3.06

 Report
 date

 01/14/02

SAMPLE DELIVERY GROUP H1584

Test	NP_	Matri:	X .	SOLID
SDG	7143			
Contact	<u>Melis</u>	ssa_C.	М	anníon_

METHOD SUMMARY

NEPTUNIUM IN SOIL ALPHA SPECTROSCOPY

Client <u>Hanford</u> Contract No. 630 Contract SDG H1584

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Neptunium 237	
Preparation batch 7012-	169			
B13073	R111055-01	7143-001	U	
BLK (QC 1D=40582)	R111055-03	7143-003	U	
LCS (QC ID=40581)	R111055-02	7143-002	ok	
Duplicate (R111055-01)	R111055-04	7143-004	- U	
Nominal values and limi 200 Area Source Chara.		d RDLs (pCi/g)	1.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE	ID	RAW TEST		MDA pCi/g		PREP	DILU-	YIELD %			 		PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7012-1	69	2σ pr	ep er	or 5.	0 % 1	Reference	Lab	Notebook	7012	pg.	169					
B13D73	R111055	5-01			0.092	2 0.500			68		112		48	12/19/01	12/20	SS-041
BLK (QC ID=40582)	R111055	5-03			0.086	5 0.500			71		112			12/19/01	12/20	SS-043
LCS (QC ID=40581)	R111055	5-02			0.19	0.500			84		113			12/19/01	12/20	SS-042
Duplicate (R111055-01) (QC ID=40583)	R111055	5-04			0.21	0.500			73		112		48	12/19/01	12/20	SS-045
Nominal values and limit	s from n	netho	ıd		1.0	0.500			20-105	- <u></u>	100	 	180			

PROCEDURES	REFERENCE	NP237_LLE_PLATE_AEA
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-934	Neptunium from Solids and Water by Extraction Chromatography, rev 2

AVERAGES ± 2 SD MDA <u>0.14</u> ± <u>0.13</u> YIELD 74 ± 14 FOR 4 SAMPLES

METHOD SUMMARIES Page 2 SUMMARY DATA SECTION Page 13

Lab id TMANC Protocol <u>Hanford</u> Version <u>Ver 1.0</u> Form <u>DVD-CMS</u> Version 3.06 Report date <u>01/14/02</u>

SAMPLE DELIVERY GROUP H1584

Test	<u>PU</u> Matrix <u>SOLID</u>
SDG	7143
Contact	Melissa C. Mannion

METHOD SUMMARY PLUTONIUM, ISOTOPIC IN SOLIDS ALPHA SPECTROSCOPY

Client	Hanford
Contract	No. 630
Contract	SDG H1584

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Plutonium 238	Plutonium 239/240	
Preparation batch 7012-	169				
B13073	R111055-01	7143-001	U	υ	
BLK (QC ID=40582)	R111055-03	7143-003	U	U	
LCS (QC ID=40581)	R111055-02	7143-002	ok	ok	
Duplicate (R111055-01)	R111055-04	7143-004	- U	- u	
Nominal values and limi 200 Area Source Chara.		d RDLs (pCi/g)	1.0	1.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID		SUF- FIX	MAX MD/ pCi/g	A ALIQ g		DILU-	YIELD X				 •	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7012-	169 2σ p	rep er	ror 5.	0 % R	eference	Lab	Notebool	c 7012	pg.	169					
B13D73	R111055-01			0.043	0.500			71		1038		49	12/21/01	12/21	SS-045
BLK (QC ID=40582)	R111055-03			0.098	0.500			89		201			12/21/01	12/21	ss-043
LCS (QC ID≈40581)	R111055-02			0.096	0.500			93		200			12/21/01	12/21	\$S-032
Duplicate (R111055-01) (QC ID≈40583)	R111055-04			0.10	0.500			82		202		49	12/21/01	12/21	SS-044
Nominal values and limi	ts from metho	od		1.0	0.500			20-105	5	100	100	 180	·		

	PROCEDURES	REFERENCE	PUISO_PLATE_AEA
		CP-060	Soil Preparation, rev 3
		CP-940	Plutonium Separation and Purification, rev 3
Į		CP-008	Heavy Element Electroplating, rev 6
1			

AVERAGES ± 2 SD MDA 0.084 ± 0.055 FOR 4 SAMPLES YIELD 84 ± 19

METHOD SUMMARIES
Page 3
SUMMARY DATA SECTION
Page 14

Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-CMS</u>

Version <u>3.06</u>

Report date <u>01/14/02</u>

SAMPLE DELIVERY GROUP H1584

Test <u>TH</u> Matrix <u>SOLID</u>

SDG <u>7143</u>

Contact <u>Melissa C. Mannion</u>

METHOD SUMMARY THORIUM, ISOTOPIC IN SOIL ALPHA SPECTROSCOPY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1584</u>

RESULTS

CLIENT SAMPLE 1D	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Thorium 230
Preparation batch 7012-	169		
B13073	R111055-01	7143-001	0.806 J
BLK (QC ID=40582)	R111055-03	7143-003	U
LCS (QC ID=40581)	R111055-02	7143-002	ok
Duplicate (R111055-01)	R111055-04	7143-004	ok U
Nominal values and limi 200 Area Source Chara.		RDLs (pCi/g)	1.0

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB Sample	ID		SUF- FIX	MAX M pCi/g			DILU-	YIELD %			FWHM keV	 •	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7012-	169	2σ pr	ep er	ror 5.	.0 %	Reference	Lab	Notebool	c 7012	pg.	169					
B13073	R11105	5-01			0.28	0.250			92		731		68	01/07/02	01/09	ss-034
BLK (QC ID≈40582)	R11105	5-03			0.37	0.250			87		172			01/07/02	01/08	\$\$-043
LCS (QC ID≈40581)	R11105	5-02			0.31	0.250			97		629			01/07/02	01/08	SS-034
Duplicate (R111055-01) (QC ID=40583)	R11105	5-04			0.34	0.250			93		172		67	01/07/02	01/08	SS-044
Nominal values and limi	ts from	metho	d	<u> </u>	1.0	0.250			20-10	5	150		 180			

ļ	PROCEDURES	DECEDENCE	THISO IE_PLATE_AEA
ļ	1 KOCEDOKES	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
1		CP-070	Soit dissolution, - itag Attiquot, 124 4
		CP-905	Thorium in Water and Dissolved Solid Sample
			Using TRU and AG 1x8 Resin, rev 1
		CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD MDA 0.32 ± 0.077
FOR 4 SAMPLES YIELD 92 ± 8

METHOD SUMMARIES
Page 4
SUMMARY DATA SECTION
Page 15

Test <u>SR</u> Matrix <u>SOLID</u>
SDG <u>7143</u>
Contact <u>Melissa C. Mannion</u>

METHOD SUMMARY TOTAL STRONTIUM IN SOIL BETA COUNTING

Client	Hanford
Contract	No. 630
Contract	SDG_H1584

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Total Strontium	
Preparation batch 7012-	169			
B13073	R111055-01	7143-001	24.6	
BLK (QC ID=40582)	R111055-03	7143-003	U	
LCS (QC ID=40581)	R111055-02	7143-002	ok	
Duplicate (R111055-01)	R111055-04	7143-004	ok	
Nominal values and limi		d RDLs (pCi/g)	1.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE	ID.	RAW TEST	SUF- FIX			PREP FAC	DILU-	YIELD			FWHM keV			PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7012-	169	2 <i>o</i> pr	ep err	or 1	0.0 %	Reference	Lab	Notebool	7012	pg.	169		•	_			
B13D73	R11105	5-01			0.17	1.00			98		200			46	12/18/01	12/18	GR8-220
BLK (QC 1D=40582)	R11105	5-03			0.23	1.00			95		100				12/18/01	12/18	GRB-201
LCS (QC ID=40581)	R11105	5-02			0.24	1.00			94		100				12/18/01	12/18	GRB-218
Duplicate (R111055-01) (QC ID=40583)	R11105	5-04			0.23	1.00			97		87			46	12/18/01	12/18	GRB-205
Nominal values and limi	ts from	metho	d d	<u> </u>	1.0	1.00			30-10	5	100			180			

PROCEDURES	REFERENCE CP-502	SRTOT_SEP_PRECIP_GPC Strontium in Solids, rev 4
	CP-519	Strontium Planchet Demounting and Preparation for 90Y Decontamination, rev 3

AVERAGES ± 2 SD MDA 0.22 ± 0.064 FOR 4 SAMPLES YIELD 96 ± 4

METHOD SUMMARIES
Page 5
SUMMARY DATA SECTION
Page 16

SAMPLE DELIVERY GROUP H1584

Test 93A Matrix SOLID
SDG 7143
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS ALPHA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1584

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID		SUF- FIX PLA	NCHET	Gross	At pha	
Preparation batch 7012-	169						
B13D73	R111055-01	93	714	3-001	U		
BLK (QC ID≈40582)	R111055-03	93	714	3-003	U		
LCS (QC ID=40581)	R111055-02	93	714	3-002	ok		
Duplicate (R111055-01)	R111055-04	93	714	3-004	-	U	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW S				DILU- TION	RESID mg					PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7012-	169 2ø pr	ep erro	or 20.0 %	Reference	Lab	Notebool	7012	pg.	169					
813073	R111055-01	93	3.2	0.100			41		100		63	12/27/01	01/04	GRB-102
BLK (QC ID=40582)	R111055-03	93	2.7	0.100			20		100			12/27/01	01/02	GRB-101
LCS (QC ID=40581)	R111055-02	93	2.0	0.100			20		300			12/27/01	01/07	GRB-115
Duplicate (R111055-01) (QC ID=40583)	R111055-04	93	3.9	0.100			42		100		67	12/27/01	01/08	GRB-109
Nominal values and limi	ts from metho	nd	10	0.100			5-250)	100	 	180			·

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-170	Soil Preparation for Direct Gross Alpha and Gross
		Beta Counting, rev 3

AVERAGES ± 2 SD	MDA	3.0	±	1.6
FOR 4 SAMPLES	RESIDUE		±	<u>25</u>

METHOD SUMMARIES
Page 6
SUMMARY DATA SECTION
Page 17

SAMPLE DELIVERY GROUP H1584

Test 938 Matrix SOLID
SDG 7143
Contact Melissa C. Mannion

METHOD SUMMARY GROSS BETA IN SOIL GAS PROPORTIONAL COUNTING

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1584</u>

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF	- PLANCHET	Gross Beta	
Preparation batch 7012-	169				- · •
813D73	R111055-01	93	7143-001	55.8	
BLK (QC ID=40582)	R111055-03	93	7143-003	U	
LCS (QC 10=40581)	R111055-02	93	7143-002	ok	
Duplicate (R111055-01)	R111055-04	93	7143-004	øk	

METHOD PERFORMANCE

CLIENT SAMPLE 1D	LAB SAMPLE ID	RAW TEST			PREP FAC	DILU-	RESID mg	EFF %				PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7012-	169 Zø pi	rep err	or 15.0 %	Reference	Lab	Notebool	7012	Pg.	169	 				
B13073	R111055-01	93	6.5	0.100			41		100		63	12/27/01	01/04	GRB-102
BLK (QC 10=40582)	R111055-03	93	5.6	0.100			20		100			12/27/01	01/02	GRB-101
LCS (QC ID=40581)	R111055-02	93	4.2	0.100			20		300			12/27/01	01/07	GRB-115
Duplicate (R111055-01) (QC ID=40583)	R111055-04	93	5.9	0.100			42		100		67	12/27/01	01/08	GRB-109
Nominal values and limi	ts from metho	od -	15	0.100		 -	5-250)	100	 	180			

ı	PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
		CP-060	Soil Preparation, rev 3
		CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
		CP-170	Soil Preparation for Direct Gross Alpha and Gross
ı			Beta Counting, rev 3
- 1	i		

AVERAGES ± 2 SD MDA 5.6 ± 1.9

FOR 4 SAMPLES RESIDUE 31 ± 25

METHOD SUMMARIES
Page 7
SUMMARY DATA SECTION
Page 18

SAMPLE DELIVERY GROUP H1584

Test	<u>GAM</u>	Matrix	K SOLID	
SDG	7143			
Contact	Melis	7 e2	Mannion	

METHOD SUMMARY

GAMMA SCAN
GAMMA SPECTROSCOPY

Client	Hanford
Contract	No. 630
Contract	SDG_H1584

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Cobalt 60	Cesium 137	
Preparation batch 7012-	169				
B13D73	R111055-01	7143-001	U	U	
BLK (QC ID=40582)	R111055-03	7143-003	U	U	
LCS (QC ID=40581)	R111055-02	7143-002	ok	ok	
Duplicate (R111055-01)	R111055-04	7143-004	- U	- U	
Nominal values and limi 200 Area Source Chara.		d RDLs (pCi/g)	0.050	0.10	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE	ID	RAW TEST					P DILU- C TION	YIELD					PREPARED	ANAL - YZED	DETECTOR
Preparation batch 7012-	169	2σ рі	rep er	ror 1	15.0 %	Referenc	e Lab	Noteboo	k 7012	pg.	169					
B13073	R11105	5-01			0.27	789					105		46	12/12/01	12/18	MB,05,00
BLK (QC ID=40582)	R11105	5-03			0.18	_ 789					115			12/12/01	12/17	01,03,00
LCS (QC ID=40581)	R11105	5-02			0.03	4 789					102			12/12/01	12/15	MB,05,00
Duplicate (R111055-01) (QC ID=40583)	R11105	5-04			0.34	_ 789					140		46	12/12/01	12/18	02,03,00
Nominal values and limit	s from	netho	od o		0.05	0 789					100	 	180			

l	PROCEDURES	REFERENCE	GAMMA_GS
		CP-060	Soil Preparation, rev 3
		CP-100	Ge(Li) Preparation for Commercial Samples, rev 3

AVERAGES ± 2 SD MDA 0.21 ± 0.26

FOR 4 SAMPLES YIELD ±

METHOD SUMMARIES
Page 8
SUMMARY DATA SECTION
Page 19

SAMPLE DELIVERY GROUP H1584

Test U T Matrix SOLID

SDG 7143

Contact Melissa C. Mannion

METHOD SUMMARY URANIUM, TOTAL IN SOIL KINETIC PHOSPHORIMETRY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1584</u>

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Total Uranjum
Preparation batch 7012-	169		
B13D73	R111055-01	7143-001	0.612
BLK (QC ID=40582)	R111055-03	7143-003	U
LCS (QC ID=40581)	R111055-02	7143-002	ok
Duplicate (R111055-01)	R111055-04	7143-004	ok
Nominal values and limi 200 Area Source Chara.		d RDLs (ug/g)	0.10

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	MDA ug/g	ALIQ 9		DILU- TION	YIELD					PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7012-	169 2 <i>a</i> pi	rep error 9	.0 % R	eference	Lab N	lotebook	7012	pg.	169					
B13073	R111055-01		0.020	0.100							47	12/19/01	12/19	KPA-001
BLK (QC 1D=40582)	R111055-03		0.002	0.100								12/19/01	12/19	KPA-001
LCS (QC ID=40581)	R111055-02		0.020	0.100								12/19/01	12/19	KPA-001
Oup(icate (R111055-01) (QC ID=40583)	R111055-04		0.020	0.100							47	12/19/01	12/19	KPA-001
Nominal values and limi	ts from metho	od	0.10	0.100					. и,	 ~	180			

	PROCEDURES	REFERENCE	UTOT_KPA
		CP-060	Soil Preparation, rev 3
		CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
į		CP-044	Sample Preparation for Total Uranium by Kinetic
ļ			Phosphorimetry, rev 3
ĺ		CP-928	Total Uranium by Kinetic Phosphorimetry, rev 3
- 1			

METHOD SUMMARIES
Page 9
SUMMARY DATA SECTION
Page 20

Bechtel Hanfor	d Inc.	CI	HAIN OF CUS	TODY/S	SAMPL	E ANALY	SIS	REQUEST	r	B0	2-006-08	Page 1	of 2
Collector Bowers DL/Watson D		Compa	ny Contact lock, CS	Telepho 372-9	ne No.			Project Coordi TRENT, SJ		Price Code	8N	Data Tur	
Project Designation 200 Area Source Characterizat	ion 200-CS-1 OU - Soil S		ing Location East H	1584 (744	7143	749	SAF No. B02-006		Air Quality	<i>7</i> 🗆	45 I	Days
Ice Chest No.	79-002		ogbook No. 1551		COA B20C816	73C		Method of Ship Fed Ex	ment				***
Shipped To Citled		Offsite	Property No.	M2 1911/03				Bill of Lading	54-9	874	1		
POSSIBLE SAMPLE HAZAI FIEZD INSTRUMENT DIRECT ON SOIL	3 WDICATE 672	cpm \$18	Preservation	None	Cool 4C	Cool 4C	Cool	4C Cool 4C	None	Cool 4C	None		
Special Handling and/or	313 D&3		Type of Container		•G	₩G	₽G	aG	аG	\$G	aG		
			No. of Container(s)	i	1	1	l	1	7	1	1		
			Volume	1000mL	500mL	1000mL	1000r	nL 120mL	60m	i. 120mL	120mL		
	SAMPLE ANALY	'sis		See item (1) i Special Instructions	Special	<i>*</i>	See item Speci Instruct	ial	рН (Зоіі)	- 9045 VOA - 8260/ (TCL); VOA 8260A (Add On) (1- Propanol, Bitanol)	- D1385		
Sample No.	Matrix *	Sample Date	Sample Time										
B13D73	SOIL	11/2/01	107301	X	1			-			~ aD		
9 19D74	soil			 			 		+ 3728	ples stored in Shipping Fa	cility on 📗	12101.	
813075	SOIL			<u></u>			 			ector not ava ples on ///			
B13D76									Sam	hies on TT./F	- •-		1 -1
B13D77 CHAIN OF POSSESSIO	SOIL	Sign/Prin				CIAL INSTR	<u></u>		<u> </u>		<u>Y</u>	<u> </u>	- (<i>o - O</i> (
Relinquished By/Removed From	DeterTime C 5 11/4/01 DeterTime 700 28 11-6-01 P.C. 11-6-0 DeterTime 7,370	Received By/Star REF 3 DISSESSED By/Star D Received By/Star	ed in 8 CA-2. Magras	Date/Time() Date/Time Date/Time	700 (1) 154 154 154 154 154 154 154 154 154 154	The Laboratory is The laboratory is Gross Alpha; Gro Buropium-155} al Uranium (Ura plunium-237; Isol LCP Metals - 60 Metals - 6010A O; Chromium 1353 fides 9030, Am	to report to report oss Bets; ; Gamma nium}; Is topic Uras 10A (Sup (Supertur x - 7196 2: IC An	Decane as a TIC if both diesel and kero Gamma Spectroscop Spec - Add-on {Am otopic Platonium; Is nium ortusce) (Arsenic B to Add-On) (Beryll	sene range by {Cesium- cricium-2- cropic The arium, Capp do Fluoric	compounds from n-137, Cobalt-60, 1 41, Radium-228; orium (Thorium-2 denium Chromium ter, Nickel, Vanadi de, Vitade, Vitale,	WTPH-D malys Suropium-152, E Strentium-89,90 12}; Americium Leed, Selenium um, Zine}; Man	ate);	8-Soil SB-Soliment SO-Solid SS-Solid SS-Solid SS-Solid W-Water U-Oil A-Ah DS-Drum Solid DE-Prom Liquids TU-Vigation V-Vigation X-Other
Relinquished By/Removed From	Date/Time	Received By/Sto	red (n	Date/Time								1961	
LABORATORY Received By SECTION	y			1	litle .						, i	Date/Time	
FINAL SAMPLE Disposal M DISPOSITION	cthod					Dispo	sed By				1	Date/Time	

SAMPLE RECEIPT CHECKLIST

				SAN	APLE R	ECEIPT					
	Bechtel		•	d In	ve,	Date/T	īme receiv	ed 11-7	01	9:31	2
CoC No	. <u>B02-</u>	006-	-08								_
Contain	er I.D. No. Er	K99	-002	Reques	ted TA	T (Days	1 45 1	P.O. Receive	ed Yes[] No [
		-		M.	ISPECT	TION					
1.	Custody seals	on ship	ping co	ntainer in	tact?		Yes [/	No [J	N/A'[3
2.	Custody seals	on ship	ping co	ntainer da	ated &	signed?	Yes (🦯	No []	N/A [1
3.	Custody seals	on sam	ple cor	tainers in	tact?		Yes [—]	No []	N/A []
4.	Custody seals	on sam	pie cor	itainers da	ated &	signed?	Yes [No (]	N/A [3
5.	Cooler Tempe	rature:		•			g material	is: Wet i	[]	Dry [-	- ∦
в.	Number of sar	nples in	shippii	ng contain	7		Ample				#
7.	Number of cor	ntainers	per sa	nple:	+	then	(Or see C	oC)		
8.	Paperwork aga	ees wit	h samp	les?			Yes [1	No [1		1
9.	Samples have:	Tape [J H	azard labe	is []	Rad lat	pels [] Ap	propriate s	ampie lab	els [/]	-
10.	Samples are:	In goo	d condi	tion [Leaki	ng[]	Broken (Container [] Missi	ng []	
11.	Describe any a	inomalia	ns:			. 		 			-
									· · ·		- -
13.	Was P.M. not					1	No []	Date			-
14.	Received by _	₹. [2. M	asotas)	Date:	11-7-	Ol Time:	9:30) Am	
Custome	r Sample No.	epm (mr/hr			Customer :	Sample No.	Cpm	mr/h	ır
	<u> </u>				-	•					
											
					-	•					
					-	•					
lon Chan	ber Ser. No.				_ (Calibrati	on date	·		•	
Survey N	leter Ser No.				_ (Calibrati	on date			-	

Form SCP-01.2, 09-25-00 Frevious editions of this form may be used.

<u> </u>	KIBINIT	NUL	W.
	SDR#	B02	-005
	Revision		0
	Date Initi	ated:	10/11/01
SAMPLE DISPOSITION RECORD		_	
SAF: B01-039			
OU: N/A			
Project ID: 221-U Tank			ļ
Task ID: 2			
Sampling Event: 221-U Tank 5-6 Sludge			,
Laboratory: 222-S Lab Operations			
Task Manager: G. M. Macfarlan			
Sampling Information:	=		
Number of Samples: 1			
ID Numbers: B118T8			
Matrix: Other Solid			
Collection Date: 01/18/01			
Issue Background:			
Classes M. Davidst Date Man Co. and Jahren and D. Marian Br. 19			
Class: Project Data Use General Laboratory Validation Direction	Sample Managem Direction	ent	
Type: Incorrect Method or Analysis Performed			
Description: Requested Analyses Not Performed			
Disposition:			
Description: The listed sample was to be analyzed for C-14 and To identified, additional waste management data requirements for diduring the collection of the listed sample (see SDR B01-106). How mistakenly analyzed a different sample (sample B10331; see SDR decisions were associated with these analyses. The laboratory wanalysis of the listed sample for C-14 and Tc-99.	sposal of was wever, the lab B02-006). No	ite gen orator o wast	nerated y e disposal
Justification: C-14 and Tc-99 data were provided for the wrong sa are needed for the listed sample to support waste management d during the collection of sample B118T8.	mple. C-14 a ecisions for v	nd Tc- vaste ç	99 data Jenerated
Approval Signatures: S. J. Trent	/(5/16/	01
Project Coordinator (Print Sign Name)		Da	te
		<i> 0 a a</i> Da	
G. M. Macfarlan		10/32	2/01
Task Manager (Print/Sign Name)		Da	ite .



Lionville Laboratory, Inc. VOA ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-006 H1584

DATE RECEIVED: 11/07/01 LVL LOT # :0111L290

CLIENT ID	LVL	#	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
							-
B13D73	001		s	01LVG054	11/02/01	N/A	11/14/01
B13D73	001	MS	S	01LVG054	11/02/01	N/A	11/14/01
B13D73	001	MSD	S	01LVG054	11/02/01	N/A	11/14/01
LAB QC:							
VBLKYY	MB1		S	01LVG054	n/A	N/A	11/14/01
VBLKYY	MB1	BS	s	01LVG054	N/A	N/A	11/14/01





Client: TNU-HANFORD B02-006

LVL #: 0111L290

SDG/SAF #: H1584/B02-006

W.O. #: 11343-606-001-9999-00

Date Received: 11-07-2001

GC/MS VOLATILE

One (1) soil sample was collected on 11-02-2001.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260B for TCL Volatile target compounds on 11-14-2001.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- 1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
- 2. The analysis holding time was met.
- 3. Non-target compounds were not detected in the sample.
- 4. All surrogate recoveries were within EPA QC limits.
- 5. All matrix spike recoveries were within EPA QC limits.
- 6. All blank spike recoveries were within EPA QC limits.
- 7. The method blank contained the common laboratory contaminant Methylene Chloride at a level less than the CRQL.
- 8. Internal standard area and retention time criteria were met.
- 9. A spectral search was performed for Decane; however, it was not detected in the sample.
- 10. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

J. Michael Taylor

President

Lionville Laboratory Incorporated

som\group\data\voa\tnu-hanford\0111-290.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

GLOSSARY OF VOA DATA

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.



GLOSSARY OF VOA DATA

DATA QUALIFIERS

- U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D = Identifies all compounds identified in an analysis at a secondary dilution factor.
- 1 marference.
- NO = Result qualitatively confirmed but not able to quantify.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.



TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

- MP Missed Peak: manually added peak not found by automatic quan program.
- PA Peak Assignment: quan report was changed to reflect correct peak assignment.
- RI Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- SP Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- CB Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- PI Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.



Lionville Laboratory, Inc.

Volatiles by GC/MS, HSL List

Report Date: 11/30/01 15:00 RFW Batch Number: 0111L290 Client: TNUHANFORD B02-006 H1584 Work Order: 11343606001 Page: 1a

Cust ID:	B13D73	3	B13D73	.	B13D7 3	3	VBLKYY		VBLKYY BS	
Sample RFW#:	001	<u>Į</u>	001 MS	3	001 MSD)	01LVG054-N	Œ1	01LVG054-M	IB1
Information Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	_ -
D.F.:	0.96	52	1.0	10	1.0	0	1.0	0	1.0	10
Units:	ug/l		ug/I		ug/K		ug/l		ug/K	
	J.	_		_	J.	•	- 3,	-	-3,	-
Toluene-d8	104	ક	100	*	104	*	101	ક	100	8
Surrogate Bromofluorobenzene	94	ક્ષ	92	8	94	용	93	ક	92	*
Recovery 1,2-Dichloroethane-d4	106	*	110	ક	110	왐	108	¥	105	*
	=======						========			=fl======fl
Chloromethane	10	U		U	11	U	10	U	10	U
Bromomethane	10	U	11	U	11	U	10	Ū	10	U
Vinyl Chloride	10	U	11	U	11	U	10	Ū	10	U
Chloroethane	10	U	11	บ	11	U	10	U	10	Ū
Methylene Chloride	12	В	13	В	12	В	2	J	4	JВ
Acetone .	2	J	2	·J	6	J	10	U	10	U .
Carbon Disulfide	5	U	6	U	6	U	5	U	5	U
1,1-Dichloroethene	5	U	114	ક્ર	119	8	5	U	99	*
1,1-Dichloroethane	5	U	6	U	6	U	5	U	5	Ū
1,2-Dichloroethene (total)	5	U	6	U	6	U	5	U	5	U
Chloroform	5	U	6	U	6	U	5	U	5	ប
1,2-Dichloroethane	5	U	6	Ū	6	Ū	5	U	5	บ
2-Butanone	10	U	11	U	11	U	10	U	10	Ü
1,1,1-Trichloroethane	5	U	6	บ	6	บ	5	Ū	5	Ü
Carbon Tetrachloride_	5	U	6	IJ	6	U	5	Ū	5	Ū
Bromodichloromethane_	5	ប	6	U	6	U	5	บ	5	Ū
1,2-Dichloropropane	5	U	6	U	6	U	5	U	5	Ü
cis-1,3-Dichloropropene	5	U	6	U	6	U	5	ט	5	Ū
Trichloroethene	5	U	100	ક્ષ	99	ક્ર	5	U	97	*
Dibromochloromethane	5	บ	6	U	6	U	5	บ	5	Ū
1,1,2-Trichloroethane	5	U	6	U	6	U	5	Ū	5	Ü
Benzene	5	U	107	ક્ષ	104	કૃ	5	Ü	98	*
Trans-1,3-Dichloropropene	5	U	6	U	6	U	5	Ū	5	Ü
Bromoform	5	Ū	6	U	6	Ū	5	IJ	5	Ü
4-Methyl-2-pentanone	10	U	11	Ü	11	Ū	10	IJ	10	ŭ
2-Hexanone	10	Ū	11	Ū	11	บ	10	U	10	Ŭ
Tetrachloroethene	5	Ü	6	Ü	6	Ü	5	IJ	5	Ü
1,1,2,2-Tetrachloroethane	5	Ü	6	Ü	6	U	5	U	5	Ū
Toluene	5	Ü	109	ž	110	ક	5	U	104	e Y
*= Outside of EPA CLP QC limits.	_	_		-		٠	3	•	104	ס

RFW Batch Number: (01111290Clie	ent: TNUHANFORD	B02-006 H1584	Work Orde	r: 11343606001	Page: 1b	_
	Cust ID:	B13D73	B13D73	B13D73	VBLKYY	VBLKYY BS	£
	RFW#:	001	001 MS	001 MSD	01LVG054-MB1	01LVG054-MB1	
Chlorobenzene		5 Ū	102 %	102 %	5 ט	99 %	
Ethylbenzene		5 Ü	6 U	6 U	5 U	5 Ü	
Styrene		5 U	6 U	6 U	5 Ü	5 U	
Xylene (total)		5 U	6 U	6 U	5 U	5 Ü	

^{*=} Outside of EPA CLP QC limits.

Lionville Labor	ratory	Use Only	Cu	ISto	dy 1	Fran	sfe	er l	Rec	ord/l	_ab '	Wo	rk	He	qu	les	I Pa	ge`	of			1	31			ı
01111	-2°	10		FIE	ELD PER	RSONN	EL: (OMF	LETE	DNLY SI	HADED	AREA A	BB K	ر 8	-	FC	101		2		ED	FE		V	ABORATO	, C
Client	ru-	Hanfor	d C	30Z -	006				Refrige	rator #		ī	2	2					2		2	2_	2-			
Est. Final Proj. Sampling Date					#/Type	Container	Liquid																			
Project # (1343-606-001-9999-00					.,,,,,,		Solid		lec,	186	<u> </u>			_	1Aq		leq	lec	Les							
Project Contact/Phone #					Volume	1	Liquid			- '							•					 				
Lionville Labo					02				Preserv	rathus .	Solid		IL.	190				-	200		11_	မှ	190			-
oc 5/2	`	Del		TAT_		9 04		 -	7100011				ORG	ANIC					INO	RG	96	Ξ.	36			
Date Rec'd	11.7.	01	Dat	te Due _	(2-	7-01			ANALYSES REQUESTED		-	7 00 200 200 200 200 200 200 200 200 200	BNA *	PCB	Herb				Metal (A)	S	10, Action	五	Hyder Diss			
MATRIX		T						ıtrix							1		Lionvill	e Lab	orato	ry Us		· ·	1		-	
S - Soil SE - Sediment SO - Solid	Lab ID		Client I	ID/Descri	lption		Chi (OC D\$en ☑)	Matrix	Date Collected	Time Collected	75290 H 7790	ואאו	0860				9	Mers.		INDRIND	HOI	HYak			
SL - Sludge	<u> </u>	Bio	2073				_	MSD				<u> </u>											X		. 1 5	
O - Oil A - Air	001	Dia	<u>5773</u>			 -	X	X	5	1/2/01	0(30	X	X.	X			·	╼┼	X		X	<u> </u>				
DS - Orum Solids	 	 					├─	-	<u></u>							<u> </u>	- 									
Di Drum Liquids	}——	 			 -							-						_								
L - EP/TCLP Leachate		†	 				-				-,	_						十				-				
WI - Wipe X - Other		 		<u></u>		 				 								7				i				
F-Fish	}			_ _		 ,												_				1				
		1		·	****																					
																		$\neg \uparrow$								
Special Instruct	ions:	SAF	#_	BOZ-	-006				REVISION	18: 1 <u>Α5.β</u>	- 010	. 01	5. (l R	. 0	Ar i	/ 2	u_		1	Jonvil	io Labo	ratory	Use Or	nly	
06	CSC	= Propa								2 Inithi	-	ICF (, Ich	O. Te				•	1) Hai	mples v Shipped nd Deli- bill #	benev	or 	1) i Pad 2) i	nper Resi Present okage Unbroke	on Ou	iter N Outer
										4 5							-		2) . 3)	Amblen Receive Indition	tore actin G	00d	3) (on Sau Tor	mple
	Relinquished Received Date Time Relinquished Reby WASTE					Received			ste	Tim	<u>. 1</u>	Discrepancies Between				Condition (Y) or N 4) Samples Property Preserved (Y) or N				Sar CO	4) Unbroken on Sample Y or N COC Record Present Upon Sample Rec't					
							1	by	i	GI		{}	COC	Record	els and ?Yor	(N)		Receive	ed With			(7) or			
Teu ex						-, - -	REV			N	NOTES:				Holding Times Cooler 5 Co					مک	. ° C					

Bechtel H	lanford Inc.	C	BAIN OF CUST	FODY/S/	AMPLI	E ANAL	YSIS	REQUES:	Г	B 02	2-006-08	Page 1	of 2
Collector Bowers DL/Watson D			Confide, Co 3/2-7038 IRENT, SJ										naround
Project Designation 200 Area Source Char	acterization 200-CS-1 OU - Soil S		ing Location East	SAF No. B02-006		Air Quality 🔲		45] ——	Days				
Ice Chest No. 5 ^	n L-382		Logbook No. 1551		COA B20CS16	73C		Method of Ship Fed Ex	ment				
Shipped To THA RECRA	.bl	Offsite	Property No.	720	<u>න</u> ්	32		Bill of Ladings	35	7951	4-8:	725	
FULD INSTRU DIRECT ON DO	HAZARDS/REMARKS MENTS INDICATE 672 L	GM P/S	Preservation	None	Cool 4C	Cool 4C	Cool	4C Cool 4C	None	Cool 4C	None		
Comples stored in R	20143Bat the 3728		Type of Container	aG /	aG 1	aG	aG		≱G 1	aG	aG		
Shipping Facility of	Samples stored in Ref.#3Bat the 3728 Shipping Facility on 1/2 Dl. Collector not available to relenquish				500mL	1000mL	1000		60mL	120mL	120mL		
samples on 1 16	<u>/(5)</u> for shipment.		Volume	See iton (I) in	See item (2) in Special	n See item (3) in Special	See item Speci		pH (Soil) - 9	045 VOA - 8260A	Hydrazine - D1385		
	SAMPLE ANALY	rsis		ing recome.	instructions.	instructions.	instruct			(TCL); VOA - 8260A (Add- On) (1- Propanol, Ethanol)	· D1363		
Sample No.	Matrix *	Sample Date	Sample Time									[12TK
B13D73	SOIL	11/2/01	0730		Χ	X	X	X	×	X	X	BI	D83
B13D74	SOIL												
B13D75	SOIL			<u> </u>									
B13D76	SOIL												
B13D77				1									
CHAIN OF POSS	SESSION	Sign/Prin	t Names		SPE	CIAL INSTR	UCTIO	NS .	•				Matrix *
Relinquished By/Removed F	wan 1/2/01/15		3778A.Kg.	1/2/01		he laboratory is	to report i	Decane as a TIC if poot diesel and keros	icue tirulle co	ompounds from W	TPH-D analysi		8=Guil SB=Sodinant SO=Golid
Retinguished By/Removed F	3 (28 1160)		Thore	ate/Time	Total	Europium-155): Historium (1 km	Gamma	General Spectroscop Spec - Add-on (Am Xopic Platentain, Is	sciaium 341, stopio Thori s	Radium 200), 8	rontium 89.90	- Total Sr:	SI=Sludge W = Water O=Oil A=Air
Relinquiched By/Removed F	ERC (1-60-01	Received By/Stor	UEX	ste/Time	(2) I ICP	CP Metals - 601 Metals - 6010A	OA (Supertre	uum— DJ ~/ ertrace) (Araenic, Bu ce Add-On) (Berylli	rium, Cadmi	ium, Chromium, I Nickel, Vanadiu	Lead, Selenium m, Zinc}; Mere	, Silver}; ury - 7471 -	DS=Drum Solids DL=Drum Liquids T=Timus
369	MIL	-	K	01 15:4	S (CV)); Chromium He NO2/NO3 - 353.	x - 7196 2; IC Ani	ions - 300.0 (Chlorid	le, Fluoride,	Nitrate, Nitrite, P	hosphate, Sulfa	te};	WI=Wips L=Liquid
Relinquished By/Removed F		Received By/Stor	edin D	ate/Time	Sulfi	des - 9030; Ams	ponia - 3,	50.3; Total Cyanide I-On) (Tributyl phos	9010				V=Vegetation X=Other
Relinquished By/Removed F	rom Date/Time	Received By/Stor	ed in D	ate/Time									
LABORATORY Rec SECTION	ceived By			Title						-	D	ate/Time	
FINAL SAMPLE Dis	sposal Method					Dispo	sed By				I	Date/Time	



Lionville Laboratory, Inc. BNA ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-006 H1584

DATE RECEIVED: 11/07/01 LVL LOT # :0111L290

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
						
B13D73	001	s	01LE1344	11/02/01	11/08/01	11/21/01
B13D73	001 MS	S	01LE1344	11/02/01	11/08/01	11/21/01
B13D73	001 MSD	s	01LE1344	11/02/01	11/08/01	11/21/01
LAB QC:						
SBLKJP	MB1	s	01LE1344	N/A	11/08/01	11/21/01
SBLKJP	MB1 BS	s	01LE1344	N/A	11/08/01	11/21/01



Client: TNU-HANFORD B02-006

LVL #: 0111L290

SDG/SAF #: H1584/B02-006

W.O. #: 11343-606-001-9999-00 **Date Received:** 11-07-2001

SEMIVOLATILE

One (1) soil sample was collected on 11-02-2001.

The sample and its associated QC samples were extracted on 11-08-2001 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for client specified and Tributylphosphate Semivolatile target compounds on 11-21-2001.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
- The sample was extracted and analyzed within required holding time. 2.
- 3. A non-target compound was detected in the sample.
- 4. All surrogate recoveries were within EPA QC limits.
- 5. All matrix spike recoveries were within EPA QC limits.
- 6. One (1) of eleven (11) blank spike recoveries was outside EPA QC limits.
- 7. Internal standard area and retention time criteria were met.
- 8. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

J. Michael Taylor

President

Lionville Laboratory Incorporated

som\gorup\data\bna\tnu-hanford-0111-290.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 1 pages.

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- U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = ... Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D = Identifies all compounds identified in an analysis at a secondary dilution factor.
- 1 = Interference.
- NO = Result qualitatively confirmed but not able to quantify.
- A = Indicates that a TIC is a suspected aldol-condensation product.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.



GLOSSARY OF BNA DATA

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.



TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

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- PA Peak Assignment: quantitation report was changed to reflect correct peak assignment.
- RI Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- SP Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- CB Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- PI Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.



L-WI-035/a-mi-10/00

Report Date: 11/30/01 14:38

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List

RFW Batch Number: 0111L290 Client: TNUHANFORD B02-006 H1584 Work Order: 11343606001 Page: la

	B13D73	3	B13D73		B13D73		SBLKJP		SBLKJP BS	
Sample	RFW#:	001	L	001 MS		001 MSD		01LE1344-M	в1	01LE1344-MB1
Information	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL
1111011110111	D.F.:	1.0	0	1.0	0	1.00)	1.0	0	1.00
	Units:	ug/I	(g	ug/K	g	ug/Kg	3	ug/K	g	ug/Kg
	Nitrobenzene-d5	88	*	86		83	8	86	*	93 %
Surrogate	2-Fluorobiphenyl	86	*	87	ક	84	욯	90	윻	96 %
Recovery	p-Terphenyl-d14	103	뫙	107	ક	103	왐	110	*	113 %
	Phenol-d5	84	¥	88	ક્ષ	80	윻	87	¥	92 %
	2-Fluorophenol	85	¥	83	ક	74	ક્ર	83	¥	85 %
	2.4.6-Tribromophenol	71	*	82	ક્ર	82	*	80	¥	82 %
	-,-,	=== === =	=f1		=fl		=f1		=fl	========f1============================
Phenol		350	U	90	ક્ષ	80	왐	330	U	94 * %
bis(2-Chlore	pethyl)ether	350	U	350	U	350	U	330	U	330 U
2-Chlorophen	101	350	Ū	84	ક્ષ	. 73	Ł	330	U	87 % .
1,3-Dichloro	obenzene	350	U	350	U	350	U	330	U	330 U
1,4-Dichloro	benzene	350	U	7 9	¥	69	ક્ર	330	U	81 %
	obenzene		U	350	Ū	350	U	330	U	330 U
2-Methylphen	nol	350	U	350	U	350	U	330	U	330 U
2,2'-oxybis	(1-Chloropropane)	350	Ų	350	U	350	U	330	U	330 U
4-Methylpher	nol	350	U	350	U	350	U	330	Ū	330 U
N-Nitroso-Di	i-n-propylamine	350	U	91	ક	84	ક્ષ	330	U	100 %
Hexachloroet	hane	350	U	350	U	350	U	330	U	330 U
Nitrobenzene		350	U	350	U	350	Ų	330	U	330 U
			U	350	U	350	U	330	U	330 U
2-Nitropheno	ol	350	Ū	350	U	350	Ū	330	U	330 U
2,4-Dimethyl	lphenol	350	U	350	U	350	U	330	Ū	330 U
bis(2-Chlore	oethoxy) methane	350	Ü	350	U	350	U	330	U	330 U
	ophenol	350	U	350	U	350	U	330	U	330 U
	lorobenzene	350	U	81	ક	77	ક	330	U	90 %
Naphthalene_		350	U	350	U	350	Ü	330	U	330 U
4-Chloroanil	line	350	U	350	Ū	350	U	330	U	330 U
Hexachlorobu	350	U	350	U	350	U	330	U	330 U	
4-Chloro-3-r	350	U	90	者	88	*	330	Ü	90 %	
	2-Methylnaphthalene			350	Ū	350	U	330	U	330 U
	Hexachlorocyclopentadiene			350	U	350	U	330	U	330 U
2,4,6-Trich		Ū	350	U	350	Ū	330	U	330 U	
2,4,5-Trich	890	U	890	U	890	U	830	U	830 U	
*= Outside	of EPA CLP QC limits.									

Cust ID:	B13D73	3	B13D73		B13D73		SBLKJP		SBLKJP BS		
RFW#:	001	l.	001 MS		001 MSD		01LR1344-ME	31	01LE1344-M	B1	
2-Chloronaphthalene	350	U	350	U	350	U	330	U	330	U	
2-Nitroaniline	890	U	890	U	890	U	830	U	830	U	
Dimethylphthalate	350	U	350	U	350	U	330	U	330	U	
Acenaphthylene	350	U	350	U	350	U	330	U	330	U	
2,6-Dinitrotoluene	350	Ü	350	U	350	U	330	U	330	U	
3-Nitroaniline	890	U	890	Ū	890	U	830	Ü	830	U	
Acenaphthene	350	U	84	ક	79	ક્ર	330	U	87	፟	
2,4-Dinitrophenol	890	U	890	U	890	U	830	U	830	ប	
4-Nitrophenol	890	U	64	¥	62	¥	830	U	72	ક	
Dibenzofuran	350	U	350	U	350	U	330	U	330	U	
2,4-Dinitrotoluene	350	U	88	용	81	૪	330	Ū	85	ક્ષ	
Diethylphthalate	350	U	350	U	350	U	330	U	330	U	
Diethylphthalate4-Chlorophenyl-phenylether	350	Ū	350	U	350	U	330	U	330	U	
Fluorene	350	U	350	U	350	U	330	U	330	ប	
4-Nitroaniline	890	U	890	Ū	890	Ü	830	U	830	U	
4,6-Dinitro-2-methylphenol	. 890	U	890	U	890	U	. 830	U	830	ט	
N-Nitrosodiphenylamine (1)	350	Ū	350	U	350	Ū	330	U	330	ט	
4-Bromophenyl-phenylether	350	U	350	U	350	U	330	U	330	ប	
Hexachlorobenzene	350	U	350	U	350	U	330	U	330	ប	
Pentachlorophenol	890	U	84	왐	74	옿	830	Ü	86	8	
Phenanthrene	350	U	350	U	350	U	330	U	330	Ū	
Anthracene	350	Ū	350	U	350	U	330	Ū	330	Ū	
Carbazole	350	Ū	350	U	350	U	330	U	330	Ü	
Di-n-Butylphthalate	350	U	350	U	350	U	330	U	330	Ū	
Fluoranthene	350	U	350	U	350	Ū	330	Ţ	330	U	
Pvrene	350	U	104	욯	97	¥	330	U	113	*	
Butylbenzylphthalate	350	U	350	U	350	U	330	U	330	ΰ	
3,3'-Dichlorobenzidine	350	U	350	Ū	350	U	330	U	330	Ü	
Benzo(a)anthracene	350	U	350	U	350	U	330	U	330	Ū	
Chrysene	350	ប	350	Ū	350	Ū	330	Ū	330	Ū	
Chrysene bis(2-Ethylhexyl)phthalate	350	U	350	Ū	350	Ū	330		330	Ü	
Di-n-Octyl phthalate	350	Ü	350	U	350	U	330		330	Ü	
Benzo(b)fluoranthene	350	U	350	U	350	U	330	Ū	330	Ü	
Benzo(k)fluoranthene	350	U	350	U		U	330	U	330		
Benzo(a)pyrene	350	U	350	U			330		330		
Indeno(1,2,3-cd)pyrene	350	U	350				330		330		
Dibenzo(a,h)anthracene	350		350				330		330		
Benzo(g,h,i)perylene	350		350				330		330		
Tributylphosphate	350		350	U	350	Ü	330		330		
Tributylphosphate (1) - Cannot be separated from Dipl	henylamine	à.	*= Outside	of	EPA CLP QC	lim	its.	-	330	3	

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS CLIENT SAMPLE NO.

B13D73				

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B02-006 H1584

Matrix: (soil/water) SOIL Lab Sample ID: 0111L290-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A112110

Level: (low/med) <u>LOW</u> Date Received: <u>11/07/01</u>

% Moisture: ___6 decanted: (Y/N)__ Date Extracted: 11/08/01

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/21/01

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: _____ CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1	1.	UNKNOWN	5.952	700	==== JB

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

SBLKJP

Client: TNUHANFORD B02-006 H1584

Matrix: (soil/water) SOIL Lab Sample ID: 01LE1344-MB1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A112108

Level: (low/med) LOW Date Received: 11/08/01

% Moisture: ____ decanted: (Y/N) __ Date Extracted: 11/08/01

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/21/01

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: _____CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) n ug/Kg

				<u> </u>
CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	****	***====		=====
1 1.	UNKNOWN	5.953	600	J

Lionville Labor	atory (Use Only	Custo	ody ¹	Tran	sfe	er l	Rec	ord/l	_ab '	Wo	rk	Re	qu	les	t Pag	3_ <u>_</u>	of <u></u>	-	1	31	k,	.1	12
0111	.29	20	F	TELD PE	RSONN	EL: (COMF	LETE	only si	IADED .	ARE/	183 K	8	•	r(()	101	D		ED	FE		V assura	AJS SETTIO	iki ini
Client	<u>u-l</u>	Hanford	1302	-006				Retrige	rator #		I	2	2				12		2	2	2_			
Est. Final Pro	. Sami	pling Date _						#/Type	Container	Uquid											<u> </u>			
Project #	(1)	343-609	6-001-9	999-00	<u>,</u>					Solid		IAG	IAG				100		leq	IAC	Loc			
Project Conta	ct/Pho	ne #						Volume	•	Liquid			<u>'</u>	ļ				1	 '					
Lionville Labo				03		··		Preserv		Solid	-	11	130				_ 5 00	2	111	60	190			
ac <u>5880</u>	 _	Del	O TAT	٥٤	day			Preserv	ABUVES		 	OFIG	ANIC	<u> </u>				IORG	8 8	=	18			
Date Rec'd	11.7.	01	_ Date Due	12.	-7-01			REQUE		-	7 §	 ₹	PCB	Herb			FIC P.		3 H	玉	F See			
MATRIX		1					ıtrix		Ī					Ţ		Lionville	Labora	tory U	7		1	,		
CODES: S - Soil SE - Sediment	Lab 10		Cilent ID/Des	cription		Chi	DEAN PAN P)	Matrix	Date Collected	Time Collected	624 H	0940 0960	OPCB				35	,	INDREED	T PH	H731			
SO - Solid SL - Sludge		<u> </u>				MS	MSD	<u></u>									HE			٠	н	<u> </u>		
	<u>001</u>	B13!	073			X	X	5	4201	0730	X	X	X				X		X	X	X	-		
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Solids DL - Drum			-					<u> </u>	1			<u> </u>							 	<u> </u>				
Liquids L - EP/TCLP		<u> </u>						<u></u>	<u> </u>										_					
Leachate WI - Wipe	· · · · · · · · · · · · · · · · · · ·		<u> </u>			<u> </u>					 	ļ				-		 	 	<u> </u>	 		. 1	
X - Other F - Fish	·						<u> </u>	<u> </u>	ļ			-					- -		<u> </u>					
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		<u> </u>				<u> </u>		REVISIO	1		<u> </u>		<u> </u>		<u></u>		<u> </u>		<u></u>		<u> </u>		لـــــــا	<u> </u>
Special Instructi		SAF = Propan	# BOZ	00% ol			A	.T© RG©	1. <u>A5.8</u> 2. INJN 3. ISF	, וככנ,	1cf	L,ICA	ios. Te			•	<u>y</u> ,	Samples () Shippo tand De Virbill #	ed	. or	Tar 1) Pa 2)	nper Res Presen ckage Unbrok	istant Ser Lon Ou P or en on C	iter N Outer
									4 5 6								_ a	1235 2) Amble 3) Recel Condition 1) Sample	ved in G	inited Good N	(3) (4)	Presen Unbrok	Y or ton Sau Or or sec on or	mple N
Relinquished by	by by by							<u></u>	Received by		inte IGI	Tin	16	Sam	ples Lai	es Between pels and 1? Y or	5 E	Property Neceives Holding	Ned With	r N	Up	on San (ord Pres	e't N
HOD Ex	Ex 2 min "/7 61 15:25 CON W							E		REV			N	NOT				-cong	Q.	r N	Te	mp. 5	مک	. °C

B13D73 SOIL (1/2/o 1 0730 X X X X BLD) B13D74 SOIL B13D75 SOIL B13D75 SOIL B13D77 Oolt B13D	Į	Bechtel	Hanford 1	Inc.		CHA	IN OF CUST	FODY/S.	AMP	LE AN	LYSIS	S RI	EQUEST	`		B02	-006-08	Page 1	of <u>2</u> ,
200 Area Source Characterization 200 CS1 OUT- Soil Samplin For Cheet No. Field Logiston No. Field Logiston No. Field Logiston No. Field Logiston No. For Cheet No. Field Logiston No. Field Logiston No. For Cheet No. Fo			ı D											ator	Price	e Code	8N		
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Samples stored in Refat Date the 3728 Shipping Facility on 11.12. QL Collector of world without the 3728 Shipping Facility on 11.12. QL Collector of war while the referencies Samples stored in Refat Date the 3728 Shipping Facility on 11.12. QL Collector of war while the referencies Samples on 11.12. QL Collector of war while the referencies Samples on 11.12. QL Collector of war while the referencies Samples on 11.12. QL Collector of war while the referencies Samples on 11.12. QL Collector of war while the referencies Samples on 11.12. QL Collector of war while the referencies Samples on 11.12. QL Collector of war while the referencies Samples on 11.12. QL Collector of war while the referencies Samples on 11.12. QL Collector of war while the referencies Samples on 11.12. QL Collector of war while the referencies Samples on 11.12. QL Collector of war while the referencies Samples on 11.12. QL Collector of war while the referencies Samples on 11.12. QL Collector of war while the referencies Samples on 11.12. QL Collector of war while the referencies Samples on 11.12. QL Collector of war while the referencies Samples on 11.12. QL Collector of war while the reference of the referenc		Ice Chest No.	mi-	382			ook No.			1673C		Me	ethod of Ships Fed Ex	nent					
POSSIBLE SAMPLE HAZARDSREMARKS FICED UNFIRE MEMORY & COLOR C		Shipped To	11/2/101		Off	Tsite Pro	perty No. A	D2 C) Ø	32		Bi	Hof Ladings	36	No.7.	951	1-8:	72°	1
Samples stored in Ref. 32 at the 3728 Shipping Facility on 11 2 QL. Collector not available to referequish samples on 11 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ſ				_			T 7											1
Samples stored in Ref. (a) 2 at the 3728 Shipping Facility on (1/2, O). Collector not available to relenquish samples on (1/0/D) for shipment. Collector not available to relenquish samples on (1/0/D) for shipment.		FICED INSTA DIEFET ON E	euments Sol	WDILATE 67,	2CPM 19/8		Preservation						4		L		<u> </u>		
Shipping Factinty of 1/1 Cell- Collector on a variable to relenquish samples on 1/1 (I/O) for shipment. Collector on tavaliable to relenquish samples on 1/1 (I/O) for shipment.]		~~			T	ype of Container	aG /) »G	•0	` '	ıG	aG	aG		aG	} aG	}	}
Collector not available to relenquish samples on 1 100 100 100 100 100 100 100 100 100	Ì	Shinning Facility	/ ON / 🗲 -	<u>U.</u> .		N	o. of Container(s)	1_1				1	1	1		1	1		
Sample No. Matrix * Sample Date Sample Time Sample No. Matrix * Sample Date Sample Time Bi3D73 SOIL (1/2/c) 1 0730 X X X X X X X X D) Bi3D74 SOIL Bi3D75 SOIL CHAIN OF POSSESSION Relinquished By/Renoved From Date/Time Date/Time Date/Time Received By/Renoved In Date/Time Received By/Renoved In Date/Time Received By/Renoved From Date/Time Received By/Renoved In Date/Time Received By/Renoved From Date/Time Date/Ti		Collector not ava	rilable to ref	enquish			Volume									:	120mL		<u></u>
Band Soil (1/20) 0730 X X X X Band Soil Start Soil Soil Soil Soil Soil Soil Soil Soil				T 11-10-1				See item (1) in Special Instructions.	Specia	i Spec	a Spe	cial	PCBs - 8082	pH (Soil) -	(T	rCL); VOA - 1260A (Add- On) {I- Propenol,			
B13D73 SOIL	ŀ	Sample No		Matrix *	Sample De		Samula Tima	P						2000					127
B13D74 SOIL B13D75 SOIL B13D76 SOIL B13D77 OON SIgn/Frint Names Relinquished By/Removed From Date/Time Received By/Stored In Date/Time Relinquished By/Removed From Date/Time Received By/Stored In Date/Time Relinquished By/Removed From Date/Time Received By/Stored In Date/Time Date/Time Received By/Stored In Date/Time	ŀ		,, 				<u></u>		1										
B13D76 SOft. B13D77 OCH. B13D77 OCH. B13D77 OCH. B13D77 OCH. Sign/Print Names CHAIN OF POSSESSION Sign/Print Names Retirequished By/Removed From Date/Time CHAIN OF POSSESSION Sign/Print Names SPECIAL INSTRUCTIONS ** The Laboratory is to report Deceme as a TIC if present in detectable quantities ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The Laboratory is to report both disease and kernsone range compounds from WTPH-D snatysin. ** The L					1112/01		0/30	 	1-4		<u> </u>	<u> </u>	12-1	X	_	<u> </u>	<u> </u>	131	<u>1283</u>
Eliagoristed By/Removed From Date/Time Received By/Stored In D	۱) .			SOIL				 	<u> </u>		-∔		- 		_ _			<u> </u>	
CHAIN OF POSSESSION Sign/Print Names Relinquished By/Removed From Date/Time Received By/Stored In Date/Time Date/Time Date/Time Date/Time Received By/Stored In Date/Time Date/Time				SOIL			†		<u> </u>										
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Relinquished By/Removed From Date/Time D	Ч	8 13D77		OOIL -				-				_					i		}
** The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from WIPH-D analysis. **The laboratory is to report both diesel and kerosene range compounds from Scale in the social section of the section of	. [CHAIN OF PO	OSSESSION				nes .												Matrix *
Relinquished By/Removed From Relinquished By/Removed From Date/Time Received By/Stored In Date/Time		KUATSONES	sure	- 11/2/01 415	REFIE	33 3	3728A.M.	Weloc	٠.٠٠ -	* The laborat	ry is to repor	t both	diesel and kerose	aue taude	compon	ands from W	TPH-D analys		S=Soil SB=Sediment SO=Solid
Relinquished By/Removed From Date/Time Received By/Stored In Date/Time Relinquished By/Removed From Date/Time Received By/Stored In Date/Time Date/Tim	1	Retinguished By/Remove	dFrom	Date/Time		Stored to	Thores	ate/Time		S4_Europium	1551: Gamm	a Spec	- Add-on (Asse	ricium 34	41. Radio	um-2261: 0t	rontium 09:90	Total Sr	SI=Sludge W = Water
Relinquished By/Removed From Received By/Stored In Date/Time	4	Relinquished by emov	PEBA	CAPACITIME 76		/Stored to				Inches Inches	(I Icanium); : Isotopic Lie : 6010A (Su	esocopi enium mectrac	- DJ - ((1/2/0/	rien. (T Imium C	Chromium 1	end Selenium	-341; Silvert	DS=Drum Solids
Relinquished By/Removed From Date/Time Received By/Stored In Date/Time Relinquished By/Removed From Date/Time Received By/Stored In Date/Time Comparison of Chloride, Fluoride, Fluori		Relinquished By/Remove	ed From		Received By/	/Stored In	D	etc/Time	—— i	CP Metals - 6	10A (Supert	песе А							DL=Drum Liquids T=Tissue
Relinquished By/Removed From Date/Time Received By/Stored In Date/Time (4) Semi-VOA - 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D Relinquished By/Removed From Date/Time Received By/Stored In Date/Time LABORATORY SECTION Received By Title Date/Time Date/Time Date/Time Title Date/Time Date/Time	ĺ	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Ex 11:	701 15:25		11 1)))) , , , , , ,	ه:کار رو	25	3) NO2/NO3	- 353.2; IC A	nions :	- 300.0 {Chloride	, Fluorid	le, Nitrat	te, Nitrite, P	hosphate, Sulfi	ate};	L=Liquid
LABORATORY Received By Title Date/Time SECTION		Relinquished By/Remove	ed From		Received By/	/Stored In			3						PH-Dies	sel Range - \	WTPH-D		V=Vegetation X=Other
SECTION		Relinquished By/Remove	ed From	Date/Time	Received By/	/Stored in	D	ate/Time									·		
FINAL SAMPLE Disposal Method Disposed By Date/Time		MINORALOW	Received By					Tic	ile									Date/Time	
DISPOSITION		FINAL SAMPLE DISPOSITION	Disposal Metho	d			<u></u>				Disposed By						1	Date/Time	



Lionville Laboratory, Inc. PCB ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-006 H1584

DATE RECEIVED: 11/07/01 LVL LOT # :0111L290

CLIENT ID	ΓΛΓ	#	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13D73	001		s	01LE1342	11/02/01	11/08/01	11/17/01
B13D73	001	MS	S	01LE1342	11/02/01	11/08/01	11/17/01
B13D73	001	MSD	s	01LE1342	11/02/01	11/08/01	11/17/01
LAB QC:							
PBLKVL	MB1		s	01LE1342	N/A	11/08/01	11/17/01
PBLKVL	MB1	BS	s	01LE1342	N/A	11/08/01	11/17/01

Humber .



Analytical Report

W.O.#: 11343-606-001-9999-00 Client: TNU HANFORD B02-006

LVL#: 0111L290 Date Received: 11-07-01

SDG/SAF#: H1584/B02-006

PCB

One (1) soil sample was collected on 11-02-01.

The sample and its associated QC samples were extracted on 11-08-01 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 11-17-01. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. The cooler temperature has been recorded on the chain-of-custody.
- All required holding times for extraction and analysis have been met. 2.
- The sample and its associated QC samples received a sulfuric acid and a sulfur cleanup. 3.
- The method blank was below the reporting limits for all target compounds. 4.
- All surrogate recoveries were within acceptance criteria. 5.
- 6. The blank spike recovery was within acceptance criteria.
- 7. All matrix spike recoveries were within acceptance criteria.
- All initial calibrations associated with this data set were within acceptance criteria. 8.
- All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria. 9.
- I certify that this sample data package is in compliance with SOW requirements, both technically and 10. for completeness, other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Deputy Laboratory Manager

pef\r:\group\data\pest\11L-290.pcb

Lionville Laboratory Incorporated

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.



GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

- U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
-] = Interference.

ABBREVIATIONS

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- DF = Dilution Factor.
- NR = Not Required.
- SP = Indicates Spiked Compound.



GLOSSARY OF PESTICIDE/PCB DATA

- This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form 1 and flagged with a "P".
- This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- This flag applies to a compound that has been confirmed by GC/MS.

PCBs by GC

Report Date: 11/20/01 14:47 Client: TNUHANFORD B02-006 H1584 Work Order: 11343606001 Page: 1 RFW Batch Number: 0111L290

,	Cust ID:	B13D73	3	B13D73	i	B13D73	i	PBLKVL		PBLKVL BS		
Sample	RFW#:	001	L	001 MS	1	001 MSD)	01LE1342-M	B1	01LE1342-M	B 1	
Information	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		
	D.F.:	1.0	00	1.0	0	1.0	0	1.0	0	1.0	0	
	Units:	UG/I	KG	UG/F	(G	UG/k	Œ	UG/K	G	UG/K	G	
Surrogate:	Tetrachloro-m-xylene	102	%	98	*	102	8	105	*	98	8	
	Decachlorobiphenyl	95	ક	99	*	100	¥	90	*	96	¥	•
===========	*======================================		==fl==		=f1=	=======	=f1	******	=fl		=f1	=======fl
Aroclor-1016		35	U	35	U	35	U	33	U	33	U	
Aroclor-1221		71	U	71	U	71	U	67	U	67	U	
Aroclor-1232		35	υ	35	U	35	U	33	U	33	Ų	
Aroclor-1242		35	U	35	ប	35	U	33	U	33	U	
Aroclor-1248		35	Ū	3.5	U	35	IJ	33	υ	33	บ	
Aroclor-1254		35	บ	92	¥	91	윰	33	U	91	*	
Aroclor-1260		35	υ	35	U	35	U	33	U	33	U	

U= Analyzed, not detected. J= Present below detection limit. B≈ Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Labor	atory	Use Only	Cust	ody '	Tran	sfe	er	Rec	ord/I	_ab	VVC	rĸ	HE	: qu	IE2	i Pa	age_	0	J. <u>`</u>	-		21		7	1
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Lionville Labo	orator	y Project Ma	anager	0						Solid	 	11	130	<u> </u>				500		11	60	190		 	
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Liquids L - EP/TCLP	<u> </u>	<u> </u>	·	 			-	<u></u>	·		-			<u> </u>									├ -		
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Bechtel Hanfor	d Inc.	C	HAIN OF CUST	ODY/S	AMI	PLE	ANAL	YSIS	RE	QUEST	r _ L	B02	2-006-08	Page 1	of <u>2</u>
Collector Bowers DL/Watson D			ny Contact riock, CS	Telepho 372-9				•		ect Coordi NT, SJ	nator	Price Code	8N		neround
Project Designation 200 Area Source Characterizat	ion 200-CS-1 OU - Soil Sa	mplin Sampli	ing Location East						SAF B02-		A	Vir Quality		45]	Days
	-382		ogbook No. 1551		CO/ B200	A 28167:	3C			nod of Ship d Ex	ment				
Shipped To 1/26		Offsite	Property No. A	720	$\supset \mathcal{Q}$	3	a		Bill	of Jadings		7951	4-8:	72°	1
POSSIBLE SAMPLE HAZAI FUELD INSTRUMENT DIRECT ON SOL	rds/remarks 5 WD1UTE 6720	AM B/S	Preservation	Noise	Coo		Cool 4C	Cool		Cool 4C	None	Coul 4C	None		
_	3		Type of Container	NG	ad	G	≇G	aG		•G	aG	NG.	aG		
Samples stored in Ref.#3	D at the 3728		No. of Container(s)	1/	1	1	1	1		ĺ	ı		1		
Collector not available to samples on 1 1015 fo	relenguish		Volume	1000mL	500		1000mL	1000c	mL	120mL	60mL	120mL	120mL		
	SAMPLE ANALYS	(Sis		See item (1) in Special Interventions.	See iten Spec Instruc	لغت	See item (3) in Special Instructions	See item Speci Instructi	ial	PCBs - 8082	pH (Soil) - 90	MS VOA - 8260A (TCL); VOA - 8260A (Add- On) (1- Propanol, Ethusol)	Hydrazine - D1385		
Sample No.	Matrix *	Sample Date	Sample Time												1272
B13D73	SOIL	11/2/01	0730	200000000000000000000000000000000000000	Χ	(X	×		Х		×	X	B	D83
B13D74	SOIL			1		`			寸			1	 	1-1214	<u> </u>
B13D75	SOIL				1										
B13D76-	SOIL													 	
B13077									\neg		1				
CHAIN OF POSSESSIO		Sign/Print		· <u>······</u>			IAL INSTR						L	<u> </u>	Matrix *
Relinquished By/Removed From Retinguished By/Removed From	Date/Tim/	Received By/Stor REF, 38 Receive By/Stor	3778A.Kg.	K/z/oc	1	** The	e laboratory is to the control of th	to report i	both die Comm e	esel and keros	ene range co	ectable quantities mpounds from W 27, Cobala 60, C	TPH-D analys	uropium-	S=Soil SB=Sediment SO=Solid SI=Shulge
Half 3B 3	<u> -11-10-01</u>	Required By/Ston		te/Time		Potal-Neptu (2) IC	leanium (Hrac nium-237: Isot P Metals - 60)	opic Lice OA (Supe	otopic P sium- ertrace)	Duranten, be Duranten (Arsenic, Ba	topio Thori ((/2/0/ rium, Cadmi	Padium 290), 9 m (Therium 23 um, Chromium, 1	ead Selenium	341; L Silver):	W = Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids
Relinquished By/Removed From	Date/Time 11-701 15:25	Received By/Store	117.	ute/Time	[(CV)	Chromium He	x - 7196				Nickel, Vanadiu Nitrate, Nitrite, F			T=Tinaue WI=Wipe L=Liquid
Relinquished By/Removed From	Date/Time	Received By/Stor		ite/Time		Sulfid	es - 9030; Amr	nonia - 35	50.3; To	otal Cyanide -	9010	-Diesel Range -		,,	V=Vegetation X=Other
Relinquished By/Removed From	Date/Time	Received By/Store	ed in Do	ste/Tune											
LABORATORY Received By SECTION		<u> </u>	<u> </u>	T	itle								3	Date/Time	<u> </u>
FINAL SAMPLE Disposal Me DISPOSITION	thod				· · · · ·		Dispo	sed By					l	Date/Time	

Figure 1. Sample Check-in List

Date/Time Received: 11.7.01 115:35	
SDG#: 0111L290	
Work Order Number:	SAF# BOD OOL
Shipping Container ID: <u>SML</u> 382	Chain of Custody # BO2 -006.08
1. Custody Seals on shipping container intact	Yes [9 No []
2. Custody Scals dated and signed?	Yes [] No []
3. Chain-of-Custody record present?	Yes [7No []
4. Cooler temperature	5.6
5. Vermiculite/packing materials is	Wests Dry [4
6. Number of samples in shipping container:	
7. Sample holding times exceeded?	Yes [] No [
8. Samples have:	hazard labels appropriate sample labels
9. Samples are:in good conditionbroken	leaking have air bubbles
10. Were any anomalies identified in sample	
Sample Custodian/Laboratory	
Telephoned to:	_OnBy



Lionville Laboratory, Inc. GCSC ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B02-006 H1584

DATE RECEIVED: 11/07/01

LVL LOT # :0111L290

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13D73 B13D73	001 001 MS	S	01LJLB12 01LJLB12	11/02/01	11/12/01 11/12/01	11/12/01 11/12/01
B13D73 LAB QC:	001 MSD	S	01LJLB12	11/02/01	11/12/01	11/12/01
BLK BLK	MB1 MB1 BS MB1 BSD	s s s	01LJLB12 01LJLB12 01LJLB12	N/A N/A N/A	11/12/01 11/12/01 11/12/01	11/12/01 11/12/01 , , 11/12/01
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Analytical Report

Client: TNU HANFORD B02-006

LVL#: 0111L290

SDG/SAF#: H1584/B02-008

W.O.#: 11343-606-001-9999-00

Date Received: 11-07-01

GC SCAN

One (1) soil sample was collected on 11-02-01.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on Method 8015B for Gasoline Range Organic (GRO) target compounds Ethanol and n-Propyl Alcohol on 11-12-01.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- 1. The sample was packaged and stored as specified in the method protocol.
- 2. Surrogates are not currently employed in the methodology.
- 3. All initial calibrations were within acceptance criteria.
- 4. All continuing calibrations run prior to analysis were within acceptance criteria.
- 5. All blank spike recoveries were within acceptance criteria.
- 6. All matrix spike recoveries were within acceptance criteria.
- 7. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Deputy Laboratory Manager

Lionville Laboratory Incorporated

r:\share\gcpest\narr temp\thu291gcsc.doc

Date

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.

GLOSSARY OF VOA DATA

DATA QUALIFIERS

- U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I unterference.
- NO = Result qualitatively confirmed but not able to quantify.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.

GLOSSARY OF VOA DATA

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.

GC SCAN

RFW Batch Number: 0111L290 Client: TNU-HANFORD B02-006 Work Order: 11343606001 Page: 1 Cust ID: B13D73 B13D73 B13D73 BLK BLK BS BLK BSD 10 Sample RFW#: 001 001 MS 001 MSD 01LJLB12-MB1 01LJLB12-MB1 01LJLB12-MB1 Information Matrix: SOIL SOIL SOIL SOIL SOIL SOIL D.F.: 1.00 1.00 1.00 1.00 1.00 1.00 Units: mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg n-Propvl Alcohol 5.5 U 89 ¥ 89 ¥ 5.0 U 94 Ethanol 5.5 U 92 ¥ 91 ક 5.0 U 97 ł 96 ł

ye 11-16 st.

Report Date: 11/13/01 08:31

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Labo	ratory	Use Only	Custo	ody Tra	nsf	er l	Rec	ord/l	Lab	Wo	ork	Re	qu	ıes	t Pag	e	of L	_	1	31	k	, I	1		
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80 - Solid SL - Studios		<u> </u>	_		MS	MSD	{			062	200	0				# ¥		ZX	HOT	HH					
W - Water O - Ot	001	B131	073		X	X	5	1/2/01			X	X				X		X	X	X		3899			
A - Air DS - Drum	L								4 1 1 1 1																
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								4										7954 7954		9 Package (Y) or N 3) Present on Sample					
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								6						<u>. </u>		- 14) Sampl	les	-	4) t Sar	Unbroks mple (Y	or	N		
Relinguished		Received	Date	Time F	lelinqui	shed		Received	О	ate	Tim				s Between		roperly	Preservi	ed N	CO	C Reco	ord Pre	sent		
by		VA C			by COM			<u>by</u>	OR	GIN	IAL		COC	Record	els and ?Y or) Received	ved With			oler _	3 %	N		
Hew Ex	- 1 %	Maria	וטודו יין	15:25	CON W				REV				NOT	ES:	•	,			N	Ter	mp. <u>5</u>	حما	. °C		
WASTE										-1/1		•••	<u> </u>												

Bechtel	Hanford	l Inc.		HAIN OF CUST	TODY/S	SAMI	PLE	ANAL	YSIS	RE	EQUEST		B0:	2-006-08	Page 1	of 2
Collector Bowers DL/Watson	n D			pany Confact arlock, CS	Telepho 372-9						ject Coordis ENT, SJ	ator	Price Code	8N	Data Tu	maround
Project Designation 200 Area Source C	haracterizati	on 200-CS-1 OU - Soil		eling Location 0 East							F No. 1-006		Air Quality	<u> </u>	45]	Days 🗠
		<u>-382</u>		Logbook No. . 1551		COA B20C	A CS 1673	c			thed of Ships red Ex	ment				
Shipped To TMARECRA	iile 101		Offici	te Property No.	D20	2C	58	a_		Bat	of Lading!	30	795	4-8:	720	}
FUELD INSTA DIRECT ON S		ds/remarks 5 WD1L4TE 67;	2Gm P/8	Preservation	None	Cool	14C	Cool 4C	Cool	4C	Coal 4C	None	Cool 4C	None		
Ĺ	つ i	7		Type of Container	aG /	*	G	aG	G		aG	2	aG	*0		
Samples stored in Shipping Facility	von // / č	L.		No. of Container(s)	1	1	t	1	1		1	1	1	1		
Collector not ava	ailable to r	elenquish		Volume	1000mL	500	mL]	1000mL	1000a	nL	120mL	60mJ	120mL	120mL		
		SAMPLE ANAL	O I YSIS		See item (1) in Special interfacement	n See item Spec Instruc	cial	See item (3) in Special Instructions.	See item Speci Instructi	iai [PCBs - 8082	pH (Soil) -	9045 VOA - 8260A (TCL); VOA - 8260A (Add- On) (1- Propanol, Ethanol)	Hydrazine - DI385		
Sample No	o. T	Matrix *	Sample Date	Sample Time	ρ'							****			1	1276
B13D73	\	SOIL	11/2/01	0730		X	7	Χ	· · ·		х		×	X	12	1
813074		SOIL	1100		 	 						Х.			Bu	100
B13D75		SUIL			-	 				\neg				 		
B13D76		SOIL				1					_			 		
B13077		BOIL			 									<u> </u>		
CHAIN OF PO				nt Names				AL INSTR							L	Matrix *
Relinquished By/Remove Retinquished By/Remove A J J	SULL ed From	Date/Time	Kecery (A By/St	3778A.16		70 20	** The	: laboratory is t nor. <u>Alpha:</u> Gor	io report l see Dota; (both di Gumm	iesel und keros na Spactrossop	- (Cosium	stectable quantitie compounds from V 137, Cobate 60, E 1, Radium 200); 8	VTPH-D analysi aropium-132, E	uropiūm-	3-6oğ SB-Goliment SO-Golid SI-Gladge
ise and they are a second	PER ST	28 11-60 	DRobins By/St	Nex.	ate/Time		Total i Naptur (2) IC	Jenium (1 leac ium-237: Jeot P Metals - 601	opic Urse QA (Supe	rtrace	Fauntum, Iso - Dow (Arsenic, Bay	(//2/0/ rium, Cada	nium, Chromium, Nickel, Vanadiu	l); Americian. Lead Selenium	241; . Silver}:	W = Water O=OH A=Air D\$=Drum Solids DL=Drum Liquids T=Times
Relinquiched By/Remove	ed From	1.701 15:25	Received By/S		Date/Time	1	(CV)	Chromium He	x - 7196				, Nitrata, Nitrita, I	-	-	Wi-Wips L-Liquid
Relinquished By/Remove		Date/Time	Received By/St	ored in D	ate/Time	1	Sulfide	s - 9030; Ama	nonia - 35	50.3; T	Total Cyanide -	9010	H-Diesel Range -	• •	w,,	V=Vugatation X=Otter
Relinquished By/Remove	ed Fram	Date/Time	Received By/St	ored In D	ate/Time											
LABORATORY SECTION	Received By		- 1		T	itle						····		D	ate/Time	
FINAL SAMPLE DISPOSITION	Disposal Me	hod		·				Dispo	sed By					ī	Date/Time	

Figure 1. Sample Check-in List

te/Time Received: 11.7-01 / 15:6	<u> </u>	
OG#: 0111L290	 SAF# BOD: 004	
ork Order Number:	•	
hipping Container ID: <u>5ML 382</u>		_
Custody Seals on shipping container inta	ci? Yes (94)	Ϋο []
Custody Seals dated and signed?	Yes [4-7	40 []
. Chain-of-Custody record present?	Yes Girl	4o []
. Cooler temperature	<u> 5 ల్ల్</u>	
. Vermiculite/packing materials is	Wet #1	Dry [4
Number of samples in shipping contained	r: <u>7</u>	
. Sample holding times exceeded?	Yes []	No 🗎
custody seals	hazard labelsappropriate sample labels	
9. Samples are: in good condition	leaking	
broken	have air bubbles	
· ·	THE AC STI DODDICS	
10. Were any anomalies identified in samp	le receipt? Yes []	No H
11. Description of anomalies (include samp	ole numbers):	
		·
Sample Custodian/Laboratory	Date:	
Telephoned to:	OnBy	•



Analytical Report

Client: TNU-HANFORD B02-006

W.O.#: 11343-606-001-9999-00

LVL#: 0111L290

Date Received: 11-07-01

SDG/SAF#: H1584/B02-006

METALS CASE NARRATIVE

1. This narrative covers the analysis of 1 soil sample.

2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.

The sample was rerun for Beryllium in file PS1115A. The Titanium result was high in file TA1114C. Beryllium is an IEC for Titanium on the Trace ICP. Therefore Beryllium was rerun on the Poly ICP.

- 3. All analyses were performed within the required holding times.
- 4. The cooler temperature has been recorded on the Chain of Custody.
- 5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
- 6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
- 7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
- 8. All ICP Interference Check Standards were within control limits.
- 9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
- 10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
- 11. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of pages.

- 12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
- 13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

- Iain Daniels

Deputy Laboratory Manager

Lionville Laboratory Incorporated

gmb/m11-290

11-28-01



METALS METHOD GLOSSARY

The following met	hods are used as refe	erence for the digestic	on and analysis	s of samples	contained within this
10t#:	3 0111129	0			
Mª 11/27/4					
Leaching Procedur	re:13101311 _	_1312Other:			
DI D BA . A. L. Dia	4: -#	a Mashada. 11 MO	20 11 3404	^	
The Metals Dig	gestion and Analysi	is Methods:ILIVIU	3.0ILM04	.0	
Metals Digestion M	1ethods:3005A	3010A 3015 30	020A /3050B	3051	200.7 SS17
20000	_ Other:				
•	- .				
	N	Aetals Analysis Me	thods		
				EPA	
	SW846	EPA	STD MTD	OSWR	USATHAMA
Aluminum	6010B	200.7			99
Antimony	6010B7041 ⁵	200.7204.2			99
Arsenic	<u> </u>	<u></u>	_3113B		99
Barium	∠ 6010B	200.7			99
Beryllium	∠6010B	200.7			99
Bismuth	6010B;	200.7 '		1620	99
Boron	6010B	200.7			99
Cadmium	∠6010B _7131A				99
Calcium	6010B	200.7			99
Chromium	∠6010B7191 °	200.7218.2	•		SS17
Cobalt	6010B	200.7			99
Copper	∠6010B7211 °	200.7220.2			99
lron	_6010B	200.7			_99
Lead	<u>√6010B</u> _7421 ⁵	200.7239.2	3113B		99
Lithium	_6010B _7430 ⁴	200.7		1620	99
Magnesium	_6010B	200.7			_99
Manganese	_6010B	200.7			99
Mercury	_7470A ' _7471A '				99
Molybdenum	6010B	200.7			99
Nickel	∠6010B	200.7			_99
Potassium	_6010B _7610 *	200.7258.1 '			_99
Rare Earths	6010B '	200.7 '		1620	_99
Selenium	∠6010B7740 ^s	200.7270.2	_3113B		_99
Silicon	_6010B '	200.7		1620	99
Silica	_6010B	200.7		1620	99
Silver	∠6010B7761 °	200.7272.2			99
Sodium	_6010B7770 ·	200.7273.1 4			99
Strontium	_6010B	200.7			99
Thallium	_6010B _7841 '	200.7279.22	00.9		99
Tin	6010B	200.7			99
Titanium	_6010B	200.7			99
Uranium	_6010B '	200.7 '		_1620	99
Vanadium	<u>√6</u> 010B	200.7			99
Zinc	∠6010B	200.7			99
Zirconium	6010B '	_200.7 1		1620	99

Method:

Other:____

5

L-W1-033/M-03/01

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- B = Indicates that the parameter was between the Instrument Detection Limit (IDL) and the Contract Required Detection Limit (CRDL)

Q QUALIFIERS

- E = The reported value is estimated because of the presence of interference.
- M = Duplicate injection precision not met.
- N = Spiked sample recovery not within control limits.
- S = The reported value was determined by the Method of Standard Additions (MSA).
- W = Post Digestion spike for Furnace AA analysis is out of control limits (85 -115 %), while sample absorbance is less than 50% of spike absorbance.
- * = Duplicate analysis not within control limits.
- += Correlation coefficient for the MSA is less than 0.995.

ABBREVIATIONS

PB = Method or Preparation Blank.

S = Matrix Spike.

T = Matrix Spike Duplicate.

 $R \text{ or } D = Sample Replicate}$

ANALYTICAL METAL METHODS

- 1. Not included in the method element list.
- 2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).
- 3. Modified Hg: HgI and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
- 4. Flame AA.
- 5. Graphite Furnace AA.

RFW 21-21L-033/O-01/97

INORGANICS DATA SUMMARY REPORT 11/27/01

CLIENT: TNUHANFORD B02-006 H1584

LVL LOT #: 0111L290

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	Result	UNITS	LIMIT	FACTOR
*****		*******	*****		********	
-001	B13D73	Silver, Total	0.0€ ಚ	MG/KG	0.06	1.0
		Arsenic, Total	3.6	MG/KG	0.32	1.0
		Barium, Total	96.9	MG/KG	0.01	1.0
		Beryllium, Total	0.50	MG/KG	0.04	1.0
		Cadmium, Total	0.25	MG/KG	0.03	1.0
		Chromium, Total	7.9	MG/KG	0.06	1.0
		Copper, Total	15.9	MG/KG	0.05	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	10.0	MG/KG	0.1	1.0
		Lead, Total	3.8	MG/KG	0.19	1.0
		Selenium, Total	0.75	MG/KG	0.22	1.0
		Vanadium, Total	78.0	MG/KG	0.05	1.0
		Zinc, Total	54.7	MG/KG	0.03	1.0

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/27/01

CLIENT: TNUHANFORD B02-006 H1584 LVL LOT #: 0111L290

WORK ORDI	ar, 11343 000 001 9900				REPORTING	DILUTION
	41mm 15	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
SAMPLE	SITE ID	*******	*****	****		=#2455E
BLANK1	01L0745-MB1	Silver, Total	0.06 u	MG/KG	0.06	1.0
PINKI	0120/40 1121	Arsenic, Total	0.32 u	MG/KG	0.32	1.0
		Barium, Total	0.06	MG/KG	0.01	1.0
		Beryllium, Total	0.04 u	MG/KG	0.04	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.11	MG/KG	0.06	1.0
		Copper, Total	0.33	MG/KG	0.05	1.0
		Nickel, Total	0.10 u	MG/KG	0.10	1.0
		Lead, Total	0.35	MG/KG	0.19	1.0
		Selenium, Total	0.23	MG/KG	0.22	1.0
		Vanadium, Total	0.05 u	NG/KG	0.05	1.0
		Zinc, Total	0.12	MG/KG	0.03	1.0
BLANK1	01C0359-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

INORGANICS ACCURACY REPORT 11/27/01

CLIENT: TNUHANFORD B02-006 H1584 LVL LOT #: 0111L290

			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	SAMPLE	RESULT	TRUOMA	*RECOV	FACTOR (SPK)
******	**********		******		*****	******	
-001	B13D73	Silver, Total	4.5	0.06u	5.0	90.0	1.0
		Arsenic, Total	177	3.6	199	87.4	1.0
		Barium, Total	268	96.9	199	86.1	1.0
		Beryllium, Total	4.7	0.50	5.0	83.9	1.0
		Cadmium, Total	4.6	0.25	5.0	87.0	1.0
		Chromium, Total	23.4	7.9	19,9	77.9	1.0
		Copper, Total	38.9	15.9	24.8	92.7	1.0
		Mercury, Total	0.16	0.02u	0.15	103.9	1.0
		Nickel, Total	52.8	10.0	49.7	86.1	1.0
		Lead, Total	46.6	3.8	49,7	86.1	1.0
		Selenium, Total	166	0.75	199	83.0	1.0
		Vanadium, Total	123	78.0	49.7	90.9	1.0
		Zinc, Total	99.7	54.7	49.7	90.5	1.0

INORGANICS PRECISION REPORT 11/27/01

CLIENT: TNUHANFORD B02-006 H1584

LVL LOT #: 0111L290

			INITIAL			DILUTION
Sample	SITE ID	ANALYTE	RESULT	REPLICATE	RPD	FACTOR (REP)
****	********	医医院教育教育的医院教育医院医院医院教育	******	*******	******	
-001REP	B13D73	Silver, Total	0.06u	0.06u	NC	1.0
		Arsenic, Total	3.6	3.3	8.7	1.0
		Barium, Total	96.9	83.5	14.9	1.0
		Beryllium, Total	0.50	0.49	3.2	1.0
		Cadmium, Total	0.25	0.21	19.5	1.0
		Chromium, Total	7.9	5.0	45.0	1.0
		Copper, Total	15.9	16.4	3.1	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Nickel, Total	10.0	7.9	23.5	1.0
		Lead, Total	3.8	3.5	8.2	1.0
		Selenium, Total	0.75	0.35	73.9	1.0
		Vanadium, Total	78.0	76.7	1.7	1.0
		Zinc, Total	54.7	51.8	5.4	1.0

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/27/01

CLIENT: TNUHANFORD B02-006 H1584 LVL LOT #: 0111L290

			SPIKED	SPIKED		
SAMPLE	SITE ID	ANALYTE	SAMPLE	TRUOMA	UNITS	*RECOV
****	***********		****		===+==	***
LCSI	01L0745-LC1	Silver, LCS	44,3	50.0	MG/KG	88.6
		Arsenic, LCS	987	1000	MG/KG	98.7
		Barium, LCS	483	500	MG/KG	96.6
		Beryllium, LCS	24.6	25.0	MG/KG	98.4
		Cadmium, LCS	24,3	25.0	MG/KG	97.2
		Chromium, LCS	49,2	50.0	MG/KG	98.4
		Copper, LCS	125	125	MG/KG	100.1
		Nickel, LCS	197	200	MG/KG	98.6
		Lead, LCS	241	250	MG/KG	96.4
		Selenium, LCS	961	1000	MG/KG	96.1
		Vanadium, LCS	250	250	MG/KG	99.9
		Zinc, LCS	96.8	100	MG/KG	96.8
LCS1	01C0359-LC1	Mercury, LCS	2,5	2.5	MG/KG	99.6

			•									Re	qu	les'	Pa	age _	of				3	V	1	I
. <i>2</i> 9	0		FIELD PEF	isonni	EL: C	OMP	LETE (only sh	IADED /		8B K	- 4	4	55.0	lol		D		EX	F	7	asviitt	\$177.5V \$ \$\$\$	DV JVI
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	Lab ID	Lab ID Received by Control of the	IL-Hanford Doze Sampling Date	FIELD PER ALL-Hanford D02-006 Sampling Date (1.343-606-001-9999-00 Act/Phone # Del STD TAT 30 ALLED Client ID/Description COI B13D73 Hors: SAC # B02-006 CSC = Propand, Ethand The Baceived by Date Time	FIELD PERSONN AU - Hanford D02 - 006 Sampling Date 1343 - 606 - 001 - 9999 - 00 Sampling Date Oster Project Manager Oster Del	FIELD PERSONNEL: C AU - Hanford D02-006 Sampling Date 11343-606-001-9999-00 Activitions Dot Date Date Date Date None: SAF # B02-006 CSC = Proposal, Ethanel Received by Date Time Relinquible Date Da	FIELD PERSONNEL: COMPA AU - Hanford Doz - 006 I. Sampling Date 11.343 - Ga6 - 001 - 9999 - 00 Interpreted Manager OT Del STD TAT 30 day 11.7.01 Date Due 12-7-01 Lab Client ID/Description (v) MS MSD CO1 B13D73 X X Home: SAF # B02-006 CSC = Propanel, Ethanel Into Relinquished by Pate Time Relinquished	FIELD PERSONNEL: COMPLETE (ALL Hanford B02-006 Sempling Date SType Stype	FIELD PERSONNEL: COMPLETE ONLY SHOULD HAVE COMPLETED HAVE COMPLE	FIELD PERSONNEL: COMPLETE ONLY SHADED A LU-Hanford D02-006 Serripling Date (1.343-606-001-9999-00 LUQUID LOUPHONE F Del STD TAT 30 day Preservatives ANALYSES REQUESTED LID CHent ID/Description MS NSD CHest D1 B13D73 AX X S Valot 0730 Lib Monric CSC = Propanel, Ethanel Time CSC = Propanel, Ethanel Reinquished Received by Date Received Date Time Reinquished Received Dy Received Dy Refrigerator # House of the propanel of the propagation of the p	FIELD PERSONNEL: COMPLETE ONLY SHADED AREA A A A A A A A A A A A A	FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS BANK COMPLETE ONLY	FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS B A K	FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS 3 A K B A K	FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS B A K	FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS B A K	FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS B A K B TITUDE CONTRIBUTE (1 2 2 2 1 1 2 1 1 2 2 1 1 2 2 1 1 1 2 1 1 1 2 1	FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS B A K	FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS & CONTROL OF THE CONTR	FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS 3 C TO COLOR A X X X X X X X X X X X X X X X X X X	FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS? A B COLOR ALL-Hanford Color Color A B COLOR A COLOR	Column C	FRELD PERSONNEL: COMPLETE ONLY SHADED AREAS 3 C TO THE STATE ONLY SHADED AREAS 3 C TO	FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS 3 A K S VIVINIA STATE

	Bechtel	Hanford	Inc.	C	HAIN OF CUST	ODY/S	AMPI	LE ANA	LYSIS	RI	EQUEST		B02	-006-08	Page 1	of 2
	flector Bowers DL/Watson	Ď			any Contact riock, CS	Telephon 372-96					oject Coordin ENT, SJ	ator P	rice Code	8N	Data Tur	naround
	nject Designation 200 Area Source Cl	haracterizatio	n 200-CS-1 OU - Soil 8	Samplin 200	ling Location East						F Na. 2-006	A	ir Quality		45 I	Days
Te	Chest No.	ML	<u>-382</u>		Loghnok No. 1551		COA B20CS	1673C			thed of Ships Fed Ex	nent				
	TMACRECRA)	ilebl		Offsit	e Property No. A	pac	7 Ø	32		Bí	Not kading !	S PHI No.	1951	1-8	720	
	POSSIBLE SAMPI FICED 12457 DIRECT ON	LE HAZARI Zument 30 L	ds/remarks 5 (VD1C1TE 67;	200m P/8	Preservation	None	Cool 4		Cox	ol 4C	Cool 4C	None	Cool 4C	None		
			_		Type of Container	#G	aG	aG	<u> </u>	G	яG	₩Ğ	#G	яG	 	
- 1 :	Samples stored i Shipping Facility	y on // / 2	L. <u>IDI</u> .		No. of Container(s)	1/	1	1	+	1	1	1	1	1	 	
	Collector not avissmples on 1	ailable to r <u>6/6</u>] for	elenquish shipment.		Volume	1000mL	500m	iL 1000ml	100	OmL	120mL	60mL	120mL	120mL	-	<u> </u>
		Z	SAMPLE ANAL			See item (1) in Special Instructions.	See item (Specia Instruction	1 Special	Spe	m (4) in ecial tetions.	PCBs - 8082	pH (Snil) - 90	45 VOA - 8260A (TCL); VOA - 8260A (Add- On) (1- Propanol, Ethenol)	Hydrazine - D1385		
-	Sample N	0.	Matrix *	Sample Date	Sample Time	γ-									1	16.77
8	13D73	N .	SOIL	11/2/01	0730		X	X	X	(X	V	×	X	BI	083
٥	13 074		SOIL			1	 		1	`	1			 	1 - 1/16	
) [8	13975		soit -						1						 	
7 [e	13076		SOIL												<u> </u>	
ŲΕ	13077	-				+					1				1	
	CHAIN OF P	OSSESSIO			nt Names			PECIAL INS								Matrix *
l	elinguished By/Remov **SuraTSON(5) ethnovished By/Remov	SWI	Date/Time	Received By/Str REF 34 Received By/Str Received By/Str	3 377844	1/2/01	"'J	The laborator	y is to repo	rt both	cane as a TIC if p diesel and keros	ene range cor v 10 osium 1 :	mpounds from V	VTPH-D analy	Europium-	S=Soil SIS=Sediment SIS=Shidge
	ethiquished By/Remov		71-10-01	Continued By/St	Dex	HILE/Time		Potal Usasium (Neptu nium 237: (2) ICP Metals	Isotonic Li 6010A (Sa	isciop conium opertra	r Addon (Am Rt Plyantum, to La Plyantum, to	topic Thoris (1/2/0/ rium, Cadmi	um, Chromium,	2); Americiun Lead, Seleniu	m, Silver);	W = Water O=Oil A=Air DS=Drum Solid DL=Drum Liqui T=Tirme
L	elinquiched By/Remov olinquished By/Remov	لبعظ	Date/Time 1-701 \6:25 Date/Time	Received By/Str	Drie 11.7.	hate/Time O1_15: c hate/Time	25	(CV); Chromium (3) NO2/NO3 - : Sulfides - 9030; /	1 Hex - 719 353.2; IC A Ammonia -	6 Valions 350.3;	- 300.0 (Chlorid ; Total Cyanide - i) (Tributyl phos	e, Fluoride, i 9010	Vitrate, Nitrite, I	Phosphate, Sul	-	W3-Whe E-Liquid V=Vegetation X=Other
R	elinquished By/Remov	ed From	Date/Time	Received By/Sta	ored in D	ate/Time	`									
	LABORATORY SECTION	Received By				Ti	lie								Date/Time	
	FINAL SAMPLE DISPOSITION	Disposal Met	hod					D	sposed By						Date/Time	



Analytical Report

Client: TNU-HANFORD B02-006 H1584

W.O.#: 11343-606-001-9999-00

LVL#: 0111L290

Date Received: 11-07-01

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

- 2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.
- 3. Sample holding times as required by the method and/or contract were met.
- 4. The cooler temperature was recorded on the chain of custody.
- 5. The method blanks were within the method criteria.
- 6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.
- 7. The matrix spike recoveries were within the 75-125% control limits.
- 8. The replicate analyses were within the 20% RPD control limit.
- 9. Results for solid samples are reported on a dry weight basis.
- 10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Deputy Laboratory Manager

Lionville Laboratory Incorporated

njp\i11-290

1-30-01 Date

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	<u>ASTM</u>	<u>SW846</u>	OTHER
% Ash	D2216-80		
% Moisture	D2216-80		ILMO4.0 (e)
% Solids	7 D2216-80		ILMO4.0 (e)
% Volatile Solids	D2216-80		- · · ·
ASTM Extraction in Water	D3987-81/85		
вти	D240-87		
CEC	_	9081	c
Chromium VI		√ 3060A/7196A	_
Corrosivity by coupon by pH			:
Cyanide, Total		9010B/9014	ILMO4.0 (e)
Cyanide, Reactive		Section 7.3/9014	_
Halides, Extractable Organic		9020B	EPA 600/4/84-008
Halides, Total		9020B	EPA 600/4/84-008
EP Toxicity		1310A	
Flash Point		1010	
Ignitability		1010	
Oil & Grease		9071A	
Carbon, Total Organic		9060	_ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	D240-87(mod)	5050	_
Petroleum Hydrocarbons, Total Rec	overable	9071	_ EPA 418.1
pH, Soil		9045C	
Sulfide, Reactive		Section 7.3/9030B	
Sulfide		✓ 9030B(mod)	
Specific Gravity	D1429-76C/ _	D5057-90	
Sulfur, Total		9056	
Synthetic Preparation Leach		1312	
Paint Filter		9095A	
Other: Systemine	Method: //s	SAFSAM- Report	TR-82-29
Other: Witrate Mitrite	Method E	PA 353.2 (mad	<i>(.)</i>
Ummonia	E	91 350.3 (mod.)
Chloride Fluoride 7 Hetrite, Phosphate,	fitrate SEI Sulfate SEI	PA 3000 (mad.)	_

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- * = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LC = Laboratory Control Sample.

NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

- ASTM Standard Methods.
- 2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
- 3. Test Methods for Evaluating Solid Waste (USEPA SW-846).
- a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).
- b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).
- c. <u>Method of Soil Analysis</u>, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).
- d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).
- e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
- f. Code of Federal Regulations.

INORGANICS DATA SUMMARY REPORT 11/26/01

CLIENT: TNUHANFORD B02-006 H1584

LVL LOT #: 0111L290

REPORTING

DILUTION

WORK C	RDER:	11343-606-001-9999-00
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SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
******	**********					
-001	B13D73	% Solids	94.0	•	0.01	1.0
		Chloride by IC	3.1	MG/KG	1.3	1.0
		Fluoride by IC	2.7 u	MG/KG	2.7	1.0
		Nitrite by IC	1.33 u	NG/KG	1.33	1.0
		Nitrate by IC	44.0	NG/KG	1.33	1.0
		Cyanide, Total	0.44 u	MG/KG	0.44	1.0
		Phosphate by IC	1.3 u	NG/KG	1.3	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
		Sulfate by IC	13.5	MG/KG	1.3	1.0
		Hydrazine	1.1 u	MG/KG	1.1	1.0
		Nitrate Nitrite	9.5	MG/KG	0.21	1.0
		Ammonia, as N	2.6 u	MG/KG	2.6	1.0
		рН	8.8	SOIL PH	0.01	1.0
		Sulfide	39.3 u	MG/KG	39.3	1.0

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/26/01

CLIENT: TNUHANFORD B02-006 H1584

WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0111L290

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	result	Units	LIMIT	FACTOR
*****	************	*******	*****		*******	
BLANK10	01LYC076~MB1	Chloride by IC	1.2 u	NG/KG	1.2	1.0
		Nitrate by IC	1.25 u	MG/KG	1.25	1.0
BLANK10	01LIC075-MB1	Chloride by IC	1.2 u	MG/KG	1.2	1.0
		Fluoride by IC	2.5 u	MG/KG	2.5	1.0
		Nitrite by IC	1.25 u	MG/KG	1.25	1.0
		Nitrate by IC	1.25 u	MG/KG	1.25	1.0
		Phosphate by IC	1.2 u	MG/KG	1.2	1.0
		Sulfate by IC	1.2 u	MG/KG	1.2	1.0
BLANK1	01LC099-MB1	Cyanide, Total	0.50 u	MG/KG	0.50	1.0
BLANK10	01LVI087-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0
BLANK10	01LH2005-MB1	Hydrazine	1.0 u	MG/KG	1.0	1.0
BLANK10	01LN3061-MB1	Nitrate Nitrite	0.20 u	MG/KG	0,20	1.0
BLANK10	01LAMA53-MB1	Ammonia, as N	2.5 u	MG/KG	2.5	1.0
BLANK10	01LSD063-MB1	Sulfide	40.0 u	MG/KG	40.0	1.0

INORGANICS ACCURACY REPORT 11/26/01

CLIBNT: TNUHANFORD B02-006 H1584 WORK ORDER: 11343-606-001-9999-00 LVL LOT #: 0111L290

MORK ORDE			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	SAMPLE	RESULT	THUOMA	*RBCOV	Factor (SPK)
******			******	*****	*****	******	
-001	B13D73	Chloride by IC	30.6	3.1	27.0	101.8	1.0
		Fluoride by IC	56.5	0.0	53.2	106.2	1.0
		Nitrite by IC	26.0	1.33u	26.6	97.8	1.0
		Nitrate by IC	103	44.0	53.2	110.5	2.0
		Cyanide, Total	4.58	0.44u	5.2	2 87.7	1.0
		Phosphate by IC	26.7	1.3 u	26.6	100.5	1.0
		Soluble Chromium VI	5.3	0.43u	4.3	118.7	1.0
		Insoluble Chromium VI	1550	0.434	1440	107.5	100
		Sulfate by IC	41.5	13.5	26.6	105.4	1.0
		Hydrazine	5.4	1.1 u	5.3	101.9	1.0
		Nitrate Nitrite	37.4	9.5	26.3	106.3	5.0
		Ammonia, as N	145	2.6 u	133	108.8	1.0
		Sulfide	540	19.7	553	94.0	1.0
BLANK10	01LYC076-MB1	Chloride by IC	24.5	1.2 u	25.0	98.0	1.0
		Nitrate by IC	25.0	1.25u	25.0	100.0	1.0
BLANK10	01LIC075-MB1	Chloride by IC	24.7	1.2 u	25.0	98.8	1.0
		Fluoride by IC	53.1	2.5 u	50.0	106.1	1.0
		Nitrite by IC	25.5	1.25u	25.0	102.0	1.0
		Nitrate by IC	24.9	1.25u	25.0	99.8	1.0
		Phosphate by IC	26.1	1.2 u	25.0	104.4	1.0
		Sulfate by IC	24.3	1.2 u	25.0	97.1	1.0
BLANK10	01LVI087-MB1	Soluble Chromium VI	4.0	0.40u	4.0	100.5	1.0
		Insoluble Chromium VI	1190	0.40u	1220	97.4	100
BLANK10	01LHZ005-MB1	Hydrazine	5.1	1.0 u	5.0	101.4	1.0
BLANK10	01LN3061-MB1	Nitrate Nitrite	5.2	0.201	5.0	103.0	1.0
BLANK10	01LAMA53-MB1	Ammonia, as N	96.8	2.5 u	100	96.8	1.0
		Ammonia, as N MSD	105	2.5 u	100	105.0	1.0
BLANK10	01LSD063-MB1	Sulfide	513	40.0 u	542	94.6	1.0
		Sulfide MSD	517	40.0 u	542	95.3	1.0

INORGANICS DUPLICATE SPIKE REPORT 11/26/01

CLIENT: TNUHANFORD B02-006 H1584 LVL LOT #: 0111L290

WORK ORDER: 11343-606-001-9999-00

			SPIKB#:	SPIKE#	2
SAMPLE	SITE ID	ANALYTE	*RBCOV	*RECOV	*DIFF

BLANK10	01LAMAS3-MB1	Ammonia, as N	96.8	105.0	8.2
BLANK10	01LSD063-MB1	Sulfide	94.6	95.3	0.78

INORGANICS PRECISION REPORT 11/26/01

CLIENT: TNUHANFORD B02-006 H1584 LVL LOT #: 0111L290

WORK ORDER: 11343-606-001-9999-00

			INITIAL			DILUTION
SAMPLE	SITE ID	ANALYTE	result	REPLICATE	RPD	factor (Rep)

-001REP	B13D73	% Solids	94.0	93.8	0.17	1.0
		Chloride by IC	3.1	4.3	32.8	1.0
		Fluoride by IC	2.7 u	2.7 u	NC	1.0
		Nitrite by IC	1.33 և	1.33u	NC	1.0
		Nitrate by IC	44.0	42.9	2.4	1.0
		Cyanide, Total	0.44u	0.52u	NC	1.0
		Phosphate by IC	1.3 u	1.3 u	NC	1.0
		Chromium VI	0.43u	0.43u	NC	1.0
		Sulfate by IC	13.5	14.4	6.6	1.0
		Hydrazine	1.1 u	1.1 u	NC	1.0
		Nitrate Nitrite	9.5	11.0	14.6	1.0
		Ammonia, as N	2.6 u	3.1	NC	1.0
		рн	8.8	8.8	0.0	1.0
		Sulfide	39.3 u	44.9 U	NC	1.0

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/26/01

CLIENT: TNUHANFORD B02-006 H1584 LVL LOT #: 0111L290

WORK ORDER: 11343-606-001-9999-00

			SPIKED	SPIKED			
SAMPLE	SITE ID	analyte	Sample	AMOUNT	units	*RECOV	
		**************			****		
LCSS1	01LC099-LCS1	Cyanide, Total LCS	1.85	2.0	MG/KG	92.6	
LCSS2	01LC099-LCS2	Cyanide, Total LCS	10.0	10.0	MG/KG	100.4	

Lionville Labor	ratory l	Use Only	Custo	ody 7	Γran	sf	er	Rec	ord/l	Lab	Wo	rk	Re	eqι	ies	t Pa	age .	<u> </u>	f <u>L</u>	-	4	31	k.	, [I
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Project #			- 001-90	199-00)			#1уре	Container	Solid		IAG	Jac					laa		lea	lac	lac		200	
Project Conta	ct/Pho	ne #						Volume	•	Liquid		'						<u>`</u>		7					
Lionville Labo				0.2				-		Solid	100	IL.	130					500		11-		190			
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O - Oil A - Air	<u></u>	B131	073		·	X	X	5	Y261	0730	X	X	X					X		X	X	X_			
DS - Drum Solids																									
DL - Drum Liquids				<u> </u>				<u> </u>			11.													3 3 5 1 1 5 3 5 5 5	
L - EP/TCLP Leachate		<u> </u>	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		_			-								 -							2 4 4 5 4 5 4 5 4 5 5 5 6 5 6 5 6 5 6 5 6	
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Hew Ex	- 1	The same	17/01	15:25		CON W	POS AST	ITE_		REV			N	NOTI			ن	Ho	Iding Ti	mes or	N	Co- Ter	oler np. <u>5</u>	<u>(a</u>	• c

Bechtel Hanford Inc.	L CH	AIN OF CUS	TODY/S	SAMP	LE ANAL	YSIS	REQU	UEST	ļ	B0:	2-006-08	Page 1	of 2
Collector Bowers DL/Watson D		y Contact ock, CS	Telepho 372-9				Project of TRENT,	Coordina SJ	tor P	rice Code	8N	Data Tu	maround
Project Designation 200 Area Source Characterization 200-CS-1 OU - Soil Samplin	Samplin 200 E	g Location ast				3 5	SAF No. B02-006		A	ir Quality	<i>,</i> 🗆	45	Days
Ice Chest No. SML-382	Field Lo EL 15	gbook No. 51		COA B20CS	11673C	· ·	Method Fed Ex	of Shipm (ent				
Shipped To 1/2/01 THARECRA	Offsite P	roperty No. A	720	ൗ Ø	32		Billof	ading/A	300	1951	4-8=	72°	1
POSSIBLE SAMPLE HAZARDS/REMARKS	, [7 7	7		1					1		
FIELD INSTRUMENTS WOULDTE 672GM, DIEST ON DOL	10/20	Preservation	None	Cool 4	IC Cool 4C	Cool	c c	ool 4C	Nome	Cool 4C	None)]
712 - All 2778		Type of Container	aG /	.G	aG ⊤	#G		aG	≱G	вG	øG.		
Samples stored in Ref.#3Bat the 3728 Shipping Facility on 11/2.00.	_	No. of Container(s)	1 1/	1		1		1	1	1	1		
Collector not available to relenquish samples on 1 16/15 for shipment.		Volume	1000mL	500ml	L 1000mL	1000	nL 12	OmL	60mL	120mL	120mL		
RT 11-6-01 sample analysis			See item (1) in Special Insurantement	n See item () Special Instruction	l Special	See item Specii Instructi	ŭ	s-2082 pl	H (Scil) - 904	IS VOA - 8260A (TCL); VOA - 8260A (Add- On) (1- Propanol, Ethanol)	Hydrazine - D1385		
Sample No. Matrix * Sar	npie Date	Sample Time											1276
B13D73 soil (1/2	101	0730		Х	X	X	7	C	<u> </u>	Х	×	R	083
813D74 SOIL				1		<u> </u>				 ^ -			20 24
B13075 SOIL		-					_			 	} 		╂───┤
B13D76 SOIL			 	1		┌──		_		 			
B13077 - BOIL				 -		-				 			}
CHAIN OF POSSESSION	Sign/Print N	iames	<u> </u>	(SP	PECIAL INSTR	UCTIO	Ne .			<u> </u>	<u></u>		1
	ved By/Stored		ete/Time	A) \$ **	* The Laboratory is	to report	Decane as a	TIC if pres	sant in dete	ctable quantities	1		Matrix *
		3728A.K.	1/2/01		* The laboratory is						=		5-Sell SS-Seliment SO-Selid
Retinquished By/Removed From Date/Time Record From Party Time Record	State of By/State of	RThores			Cross Alpha; Gr 54 Europium-155)	· Gamma :	Proc . Add.	nn I Americ				T . 10	Sir-Sinder W = Water
Remarkated by Control France C. Pare Timo 760 Reda	ed By/Stored	is O D	ate/Time	T	otal Usenium (Lica eptunium-237: Isot	n um), is t	topic Pinku	itur. bote	oie Therius	- (Thorium 230), Americian 2	141;	O=Oil AMAir
N PRUII-10-01 T	EL	Jex.		(2) ICP Metals - 60	10A (Supe	rtrace) (Ars	enic. Buriu	m. Cadmiu	m, Chromium, 1	Lead, Selenium,	Silver);	DS=Drum Solida DL=Drum Liquids
100 E 11701 15:35	ved By/Stored	5 · () 11 = .	ate/Time		P Metals - 6010A V); Chromium He	x - 7196							T=Times WI=Wips
	ved By/Stored		ate/Time	Sı	i) NO2/NO3 - 353. ulfides - 9030; Ama	monia - 35	0.3; Total C	yunide - 90	10			e};	L*Liquid V=Vegetation
				(4	l) Semi-VOA 82	270A (Add	-On) (Tribu	ityi phosphi	ate}; TPH-l	Diesel Range - \	WTPH-D		X=Odus
Relinquished By/Removed Fram Date/Time Recei	ved By/Stored	In D	ate/Time	}									
LABORATORY Received By SECTION			Ti	itle		-			- :::		De	te/Time	<u></u>
FINAL SAMPLE Disposal Method DISPOSITION					Dispo	sed By			- 441		D	ste/Tune	

Figure 1. Sample Check-in List

Date/Time Received: 11.7.01 115:25	_
SDG#: 0111Lago	
Work Order Number:	SAFI <u>BO2</u> 006
Shipping Container ID: SML 382	Chain of Custody # 802-006-08
1. Custody Seals on shipping container intact?	Yes (19 No []
2. Custody Seals dated and signed?	Yes [] No []
3. Chain-of-Custody record present?	Yes [No []
4. Cooler temperature	5.6
5. Vermiculite/packing materials is	Wei 1 1 Dry [4
6. Number of samples in shipping container:	7
7. Sample holding times exceeded?	Yes [] No [4]
8. Samples have: tape custody seals	_hazard labels _appropriate sample labels
9. Samples are:in good conditionbroken	leaking have air bubbles
10. Were any anomalies identified in sample 111. Description of anomalies (include sample	receipt? Yes [] No H
	Date:
Telephoned to:	OnBy



Lionville Laboratory, Inc. DRO ANALYTICAL DATA PACKAGE FOR TNU-HANFORD B02-006 41584

RFW LOT # :0111L290

CLIENT ID	RFW #	‡ 1	XTM	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
								
B13D73	001		S	01LE1343	11/02/01	11/07/01	11/12/01	11/13/01
B13D73	001 N	1 S	S	01LE1343	11/02/01	11/07/01	11/12/01	11/13/01
B13D73	001 N	ISD	S	01LE1343	11/02/01	11/07/01	11/12/01	11/13/01
LAB QC:								
BLK	MB1		s	01LE1343	N/A	N/A	11/12/01	11/13/01
BLK	MB1 E	3S	s	01LE1343	N/A	N/A	11/12/01	11/13/01

Jen " Indo



Analytical Report

Client: TNU HANFORD B0-006

LVL#: 0111L290

SDG/SAF#: H1584/B02-006

W.O.#: 11343-606-001-9999-00

Date Received: 11-07-01

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 11-02-01.

The sample and its associated QC samples were prepared on 11-12-01 and analyzed according to Lionville Laboratory OPs based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 11-13-01. The analysis met the intent of method WTPH-D.

- 1. The cooler temperature has been recorded on the chain-of-custody.
- 2. All required holding times for extraction and analysis were met.
- 3. All initial calibrations associated with this data set were within acceptance criteria.
- 4. All diesel continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.
- 5. All surrogate recoveries were within acceptance criteria.
- 6. The blank spike recovery was within acceptance criteria.
- 7. All matrix spike recoveries were within acceptance criteria.
- 8. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Jain Daniels

Deputy Laboratory Manager

Lionville Laboratory Incorporated

R:\share\dro\11-290.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 7 pages.

GLOSSARY OF DIESEL RANGE ORGANICS DATA

DATA QUALIFIERS

- U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g. 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates a compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
-] = Interference.

ABBREVIATIONS

BS = Indicates blank spike reagent grade water spiked with the matrix spiking solution. Spike recoveries are reported.

BSD = Indicates a blank spike duplicate.

MS = Indicates a matrix spike.

MSD = Indicates a matrix spike duplicate.

NA = Not Applicable.

NS = Not spiked.

DF = Dilution factor.

NR = Not required.

SP = Indicates a spiked compound.

DIESEL RANGE ORGANICS BY GC

RFW Batch Number: 0111L290 Client: TNU-HANFORD B02-006 Work Order: 11343606001 Page: 1 Cust ID: B13D73 B13D73 B13D73 BLK BLK BS Sample RFW#: 001 001 MS 001 MSD 01LE1343-MB1 01LE1343-MB1 Information Matrix: SOIL SOIL SOIL SOIL SOIL D.F.: 1.00 1.00 1.00 1.00 1.00 Units: mg/Kg mq/Kq mg/Kg mg/Kg mg/Kg p-Terphenyl 46 * 87 * 92 * 91 * 79 Diesel Range Organics 12.8 U 82 89 % 12.0 U 78 % Kerosene 12.8 U NS NS 12.0 U NS

Jkon "1.0/01

Report Date: 11/14/01 08:28

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

4

Lionville Labo			Cust											-	les	I Pag	e(oftc		1	31		1	1
OIIIL	- 07			TELD PE	HEUNIN	انبا	COM	PLETE	ONLY S	HADED	ARE/ A	NB Y	& ⊗	-	V (()	101	2		ED	至		RENALIDE I	Y Ch. Alton)
Client	nu-l	tanford	1302	-006				Refrige	rator#			2	2				12	7	7.	2	2			
Est. Final Pro								#Tuna	Container	Liquid														
Project #	11:	343-606	-001-9	999-00	<u>.</u>				-	Solid		IAC	IAC				Ja	1	le	امدا	lac			. [مام] د
Project Conta	ct/Pho	ne#	-					Volume		Liquid		′											.5	
Lionville Labo	orstory	Project Man	ager	্ত্য						Solid		11	190				5 00		14	60	مدر		沙溪	7
oc SPE	<u> </u>	Del	TAT.	34	day			Preser	/stives			1=	ANIC	<u> </u>					-	2.200		4. P	(1) (P)	*
Date Rec'd	11.7.0	<u> </u>	Date Due		7-01			ANALY REQUE		-	1 200 €		1 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	g P			Meter	ORG 5	2 2 X	舌	100			
MATRIX						-	etríx	ļ <u>-</u>			 		1	-	<u></u>	Lionville						<u> </u>		
CODES: S - Soil SE - Sediment SO - Soild	Leb ID		Client ID/Deac	cription		Ch	9C 088n (/)	Matrix	Date Collected	Time Collected	7624 H	2529D	ofto				FCEL MITO		INDER	IPH	11/21/			
SL - Studge W - Water		12:20	<u> </u>			T	MSD	6					_					-	} _		H A	F 13.4		
O - OII A - Air	001	BIBE	<u> </u>			X	X	5	12/01	0130	X	X	X				X	-	X	X	<u> </u>		e de grande Superior de la Superior de la	1.34
DS - Drum Solids			<u> </u>			_	-				-							-	-					3/3/4 Mg 14/5
DL - Orum Liquids			<u> </u>			-			<u> </u>		_							-	-					بالنت
L - EP/TCLP Leachate		· · · · · · · · · · · · · · · · · · ·					 				ļ							<u> </u>	ļ					- 1
WI - Wipe X - Other			· · · · · · · · · · · · · · · · · · ·				 											ļ	-		1,37.			PSIII Tees
F - Fish							_						25.					-	<u> </u>	1		\		
									<u> </u>				-											
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			·	· · · · · · · · · · · · · · · · · · ·			 	·····						<u>. </u>			<u> </u>							
			Po-	-01			DATE	REVISION	8.						1		_ <u></u>	<u></u>						
Special instructi		= Propand	st BOZ (, Ethano					ra() :	As. B	ICCL,	ICF L	,Ica	OS, Te		-	•	51) Ha 44 22 33 Cc 4)	shippe shippe and Deli rbill # 2.35 Ambier Receive ondition(Sample	TOTAL TOTAL	872 873 00d N	Tant 1) Pac 2) Pac 3) 4) Sar	per Residence Present (Inbroke Stage (Inbrok	tent Seal on Oute or I on Ou or I on Sem or or or N	er N uster N nple N
Relinquished by		Received by	Date	Time		inqui by	hed		leceived by	i	tte it	Tim		Samp	les Lab	Between	5)	Receive	od With	N	CO	C Reco	nd Prese Ne Rec'i Y) or	tne Y N
HOD Ex	18	Monion	اهادا" (15:25			POS AST		'	PEN		•	N	NOTE		?Y or (1	УĤ	olding Ti	or or		Cor	hp. <u>5</u>	٠.	င

Bechtel Hanf	ford Inc.	C	HAIN OF CUST	CODY/S	AMP	LE ANAL	YSIS R	EQUES:	r	В02	2-006-08	Page 1	of 2
Collector Bowers DL/Watson D			Company Contact Telephone No. Cearlock, CS 372-9638					Project Coordinator TRENT, SJ		Price Code 8N		Data Turnaround	
Project Designation 200 Area Source Characterization 200-CS-1 OU - Soil Samplin			Sampling Location 200 East					SAF No. B02-006		Air Quality 🔲		45 Days	
Ice Chest No. SM	L-382		Logbook No. 1551		COA B20C	81673C		ethod of Ship Fed Ex	ment				
Shipped To 1/2/01		Official	te Property No. A	020	700	32	Bi	Hot Lading!	AS DEEP	7951	4-8:	72°	}
FUELD INSTRUME DIRECT ON SOL	zardskemarks Wis WDILATE 67	20m 10/8	Preservation	None	Cool		Cool 4C	Cook 4C	None	Cool 4C	None		
•			Type of Container No. of Container(s)	1 aG	aG 1		aG 1	∎G 1	aG l	1	aG		
Shinning Facility on //	amples stored in Ref.#3Bat the 3728 hipping Facility on 11/2 101.												
Collector not available samples on 1 1616	to relenguish		Volume	1000mL	500m	nL 1000mL	1000mL	120mL	60mL	120mL	120mL		
	RT 11-10- SAMPLE ANAI	O Lysis		See item (1) in Section in the section of the secti	See item Speci Instructi	ial Special	See item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 94	45 VOA - 8260A (TCL); VOA - 8260A (Add- On) (1- Propanol, Ethanol)	Hydratine - D1385	-1	1638
Sample No.	Matrix *	Sample Date	Sample Time										1 2 3 2
B13D73	SOIL	11/2/01	0730		X	Х	Х	×	_ X	_×	X	Bu	D83
B13D74	SOIL												
313075	SOIL												1
313D76	SOIL												
913D77	BOIL			ļ									
CHAIN OF POSSESS		Sign/Prin				PECIAL INSTR		<u> </u>			<u> </u>	<u> </u>	Matrix *
telinquished By/Respoyed From KuATSOMETS WA	Date/Time 1/2/01 11	Received By/Sta	3778AM.	NEDOC	"'	** The Laboratory is ** The laboratory is t	to report Deca to report both o	ene as a TIC if p diesel and keres	present in del sens range co	ectable quantities impounds from W	: 71PH-D analysi	4.	S-Soil EB-Soliment
Herinquished By/Removed From			71	te/Time/07	. [1	(1) Gener Alpha; Ger 154 <u>Europium 155):</u> Potal Usanium (I Iran	Gamma Spec	- Add on (Am		Dedicate 2001-0		Total Sr	SO-Solid SI-Shelps W = Water O-Oil
elingfished by Endyld Fram	al-10-01	Reduced By/Sto	Dex."	te/Time	1 2	Neptunium-237: Isoto (2) ICP Metals - 601	<u>roic I frantism</u> OA (Supertrac	→ DJ W e) (Arsenic, Ba	((/Z/O) rium, Cadmi	um, Chromium, I	end Selenium	Silver):	AmAir DS-Drum Solids DL-Drum Liquids
elinquiched By/Removed From	Date/Time	Received By/Spor		te/Time	I(CP Metals - 6010A ((CV), Chromium Her	c - 7196				-	-	T=Tienus Wj=Wipe
elinquished By/Removed From	11-701 15:25 Date/Time	Received By/Sto	11-7.0 redn D	te/Lime	2	(3) NO2/NO3 - 353.2 Sulfides - 9030, Amm (4) Semi-VOA ~ 822	xonia - 350.3;	Total Cyanide -	9010			te};	1-Cipse V=Vegetation 2=Ciber
elinquished By/Removed From	Date/Time	Received By/Sto	red In Di	te/Time									İ
LABORATORY Received SECTION	d By			Tit	lo		-				D	ate/Time	
FINAL SAMPLE Disposal			<u></u>			Dispos						ate/Time	

Figure 1. Sample Check-in List

te/Time Received: 11.7.01 115:2	5
0111Lago	· · · · · · · · · · · · · · · · · · ·
ork Order Number:	SAF# BO2:006.
nipping Container ID: <u>SML</u> 382	Chain of Custody # 802-006-08
Custody Seals on shipping container intac	17 Yes [9 No []
Custody Seals dated and signed?	Yes [] No []
Chain-of-Custody record present?	Yes [No []
Cooler temperature	56
. Vermiculite/packing materials is	West Dry [4
. Number of samples in shipping container	:
. Sample holding times exceeded?	Yes [] No []
8. Samples have: tape custody seals	hazard labelsappropriate sample labels
9. Samples are: in good condition broken	leaking have air bubbles
10. Were any anomalies identified in sample11. Description of anomalies (include sample)	e receipt? Yes [] No H
Sample Custodian/Laboratory	Date: